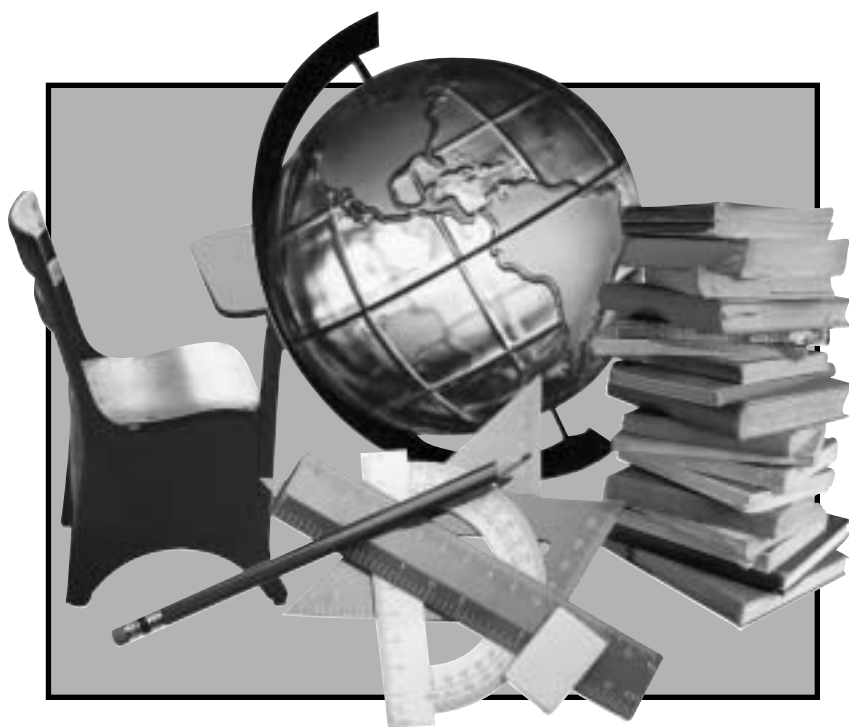




Nevada

CRITERION REFERENCED TESTS



REVIEW GUIDE

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INTRODUCTION

Purpose

The Criterion Referenced Tests (CRT), as mandated by legislation (Nevada Revised Statute 389.550), are designed to provide a means of measuring student academic achievement and proficiency in the Nevada State Content and Performance Standards. They are intended to help ensure that students are appropriately prepared in the curricula as set forth in the state standards. Unlike a norm-referenced test that is designed to compare an individual student, school, district, or state test score to an average score as determined by an entire test-taking population, the criterion-referenced test score is reported in terms of both group and individual student outcomes based on a pre-determined criterion of correct responses to measure proficiency and achievement levels.

This review guide is intended to be used by teachers, principals, and school districts as a supplemental tool — one that complements current efforts aimed at preparing students for the state proficiency examinations and/or remedial efforts based in part on student test performance. Each test includes only a portion of the curriculum content that students are expected to know. Although the guide provides a sampling of representative items for the CRT, the sample of items does not constitute a practice test and was not designed to provide “drill” activities.

Rationale and Philosophy

The Nevada comprehensive assessment system serves as an ongoing evaluative technique that allows monitoring of the extent to which students are acquiring necessary knowledge and skills. While necessary knowledge and skills may be characterized in multiple ways, they are primarily defined through the state content and performance standards that provide the basis of aligned curriculum and instructional practice.

Assessment can be viewed as multi-faceted. It can be considered as an objective monitoring tool that stands outside the triangle of standards, curriculum, and instruction. It can also be regarded as an integral aspect of curriculum and as an instructional tool. It may be that different assessment strategies can serve these multiple facets. If so, as is the case with standards, curriculum, and instruction, multiple forms of assessment, including varied large-scale assessments and site-based assessments, must be interlocked or aligned. As such, Nevada’s assessment efforts are part of statewide systemic reform.

National Assessment of Educational Progress (NAEP)

Nevada is among the states that receive Title I funding and must therefore participate in state NAEP norm-referenced assessments in reading and mathematics at grades 4 and 8. A sample of Nevada students will be tested through the National Assessment of Educational Progress program in reading annually each spring from years 2002 to 2010 and in mathematics from 2003 to 2010. In addition, the NAEP science assessment will be given in years 2004 and 2008 and the writing assessment will be given in years 2002, 2006, and 2010. Information on these assessments may be obtained at <http://nces.ed.gov/nationsreportcard/>.

Norm-Referenced Assessment

The norm-referenced assessments, as described in Nevada Revised Statute 389.015, are administered annually each fall to every Nevada student in grades 4, 7, and 10. Subjects tested include reading/language arts, mathematics, science, and social studies. The current testing contractor is Riverside Publishing Company, and it is responsible for the distribution and scoring of the Iowa Tests of Basic Skills in grades 4, 7, and 10.

(For more information, go to http://www.riverpub.com/products/group/itbs_a/home.html), and the Iowa Tests of Educational Development in grade 10 (for more information, go to http://www.riverpub.com/products/group/ited_a/home.html).

Criterion-Referenced Assessment

The Nevada CRT program was initially mandated in 1999 and piloted in the 2000-2001 school year in mathematics and reading in the 3rd and 5th grades. The 5th grade science test and the 8th grade mathematics, reading, and science tests were field tested in the 2002-2003 school year. The test items are developed by Nevada teachers with the assistance of the Nevada Department of Education, Harcourt Educational Measurement Company, and the WestEd Regional Educational Laboratory. Nevada test items undergo a thorough review for alignment with Nevada Standards and for possible bias. Students will be tested in the spring within the testing window of March 15–April 15, 2004. Each test takes approximately 120 minutes and contains between 50 and 75 items. Ten to fifteen field test items, used for future test development, are embedded in the total item count number.

Since each form of assessment taken individually may serve a narrower purpose, each assessment in the Nevada Proficiency Examination Program must be considered in conjunction with all other forms of assessment. This concept is consistent with the adage that the whole is greater than the sum of its parts. Each form of assessment provides useful bits of information, but the interpretation of student and school achievement is better informed by looking at the influence of multiple measures. (See Figures 1 and 2.)

Figure 1 — A Complementary System Of State, Local, And Building Level Assessment Practices

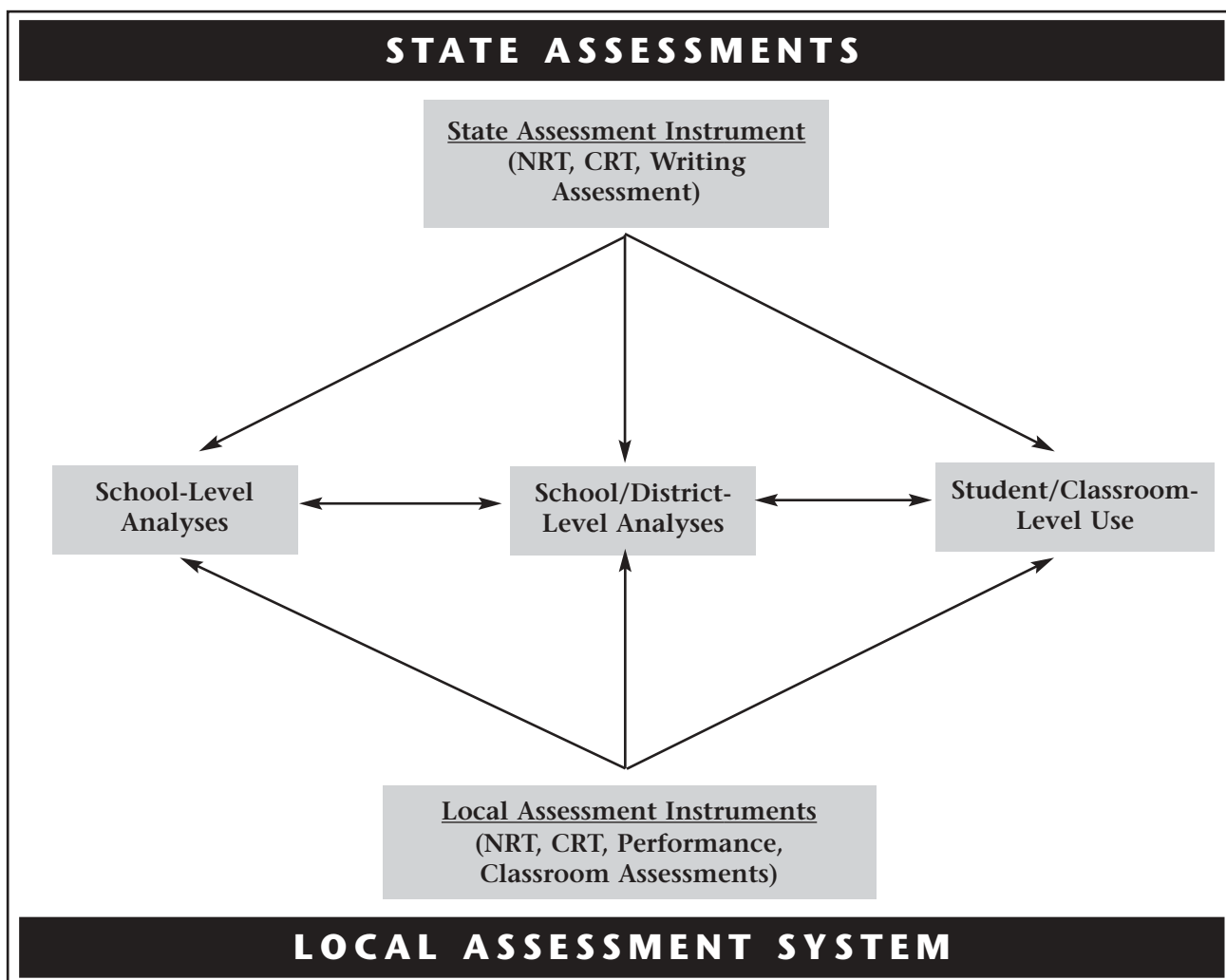
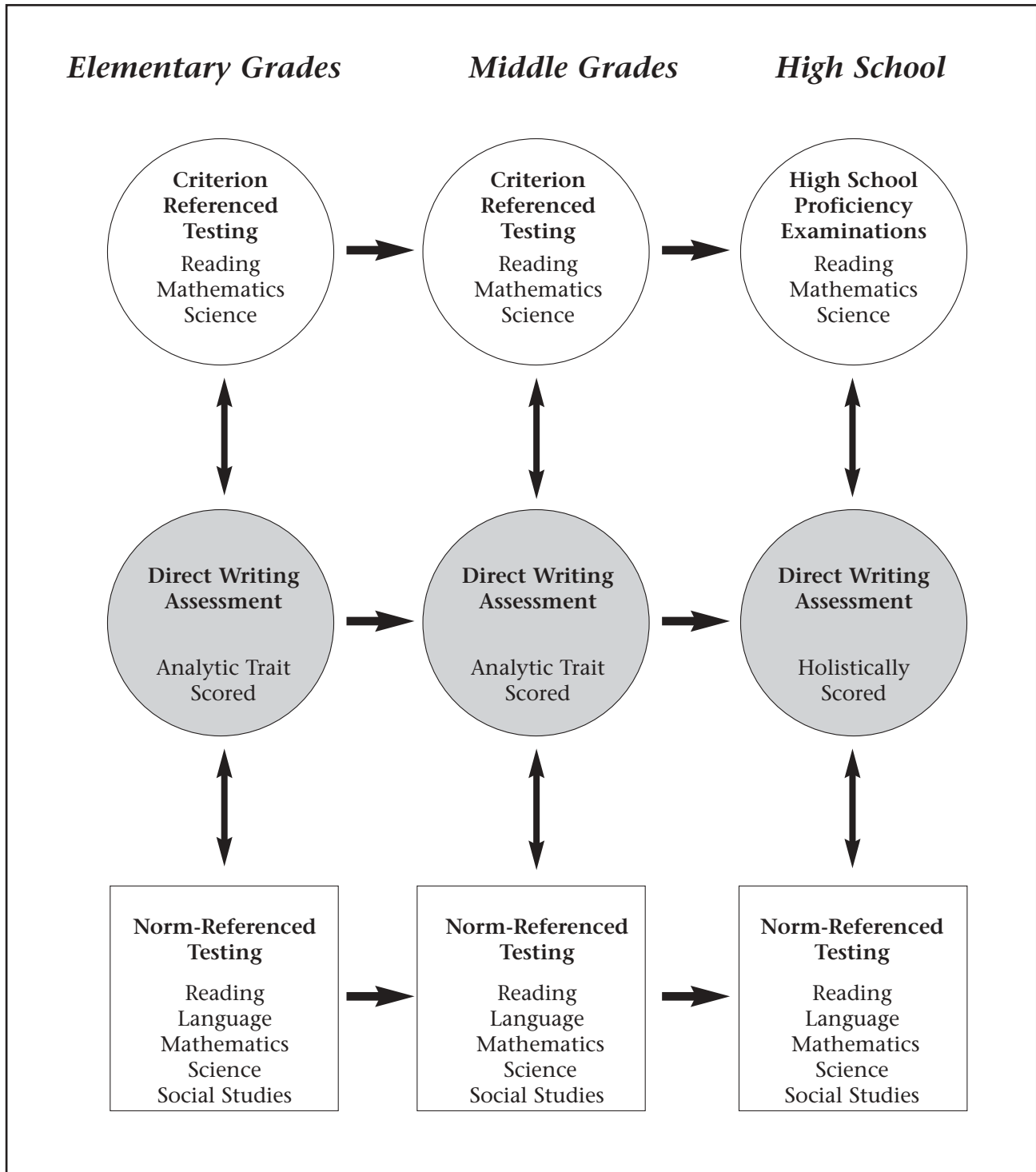


Figure 2 — State-Level Assessment Flow



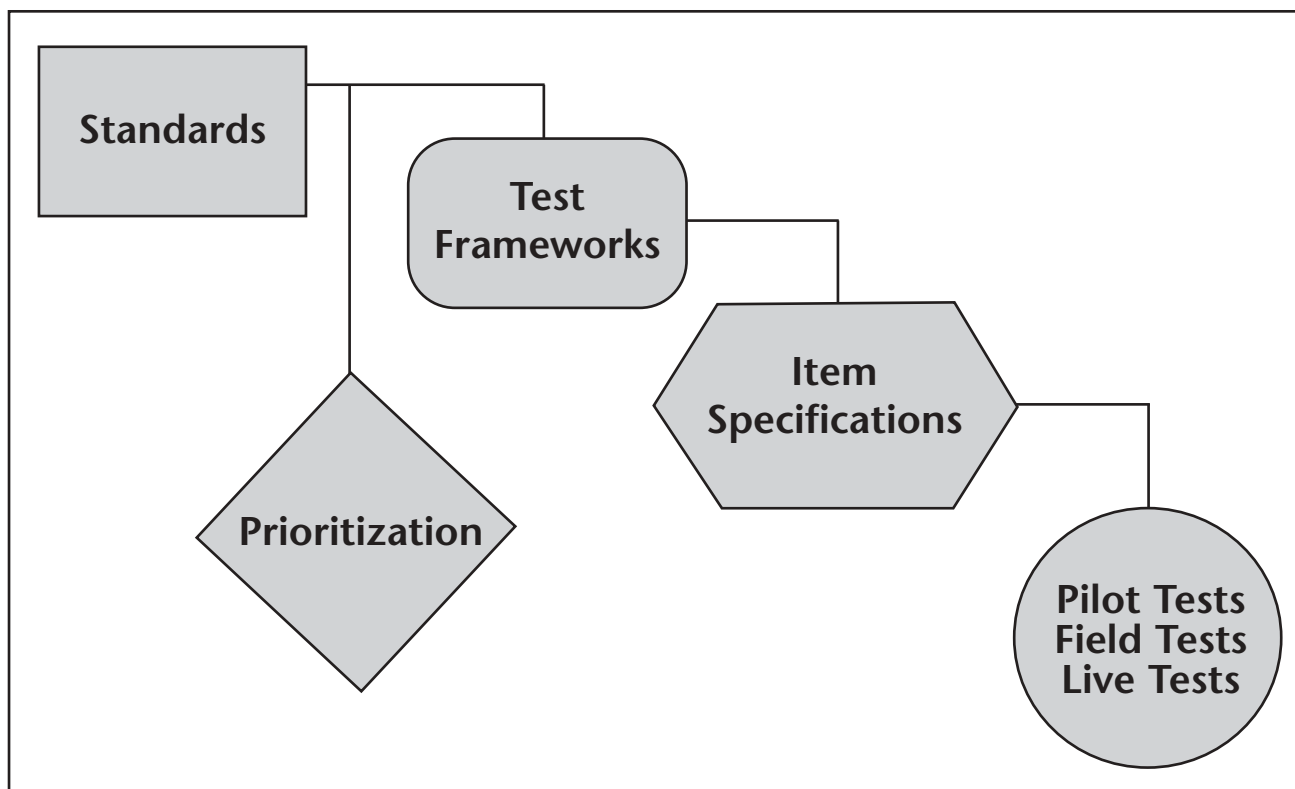
Accountability and Alignment

Current reform initiatives, most recently the federal *No Child Left Behind Act*, are built on the notion of “results-based” accountability. Stated simply, students are responsible for learning standards-based content knowledge and skills, and educators are responsible for providing students with the opportunity to learn and demonstrate that knowledge and those skills.

This much is known about accountability systems and the role of assessments: When the stakes are high, whether applied to students or to schools, the assessments drive classroom instruction and/or behavior, and there is motivation to perform well on the accountability measures. Directing instructional change can be desirable and is arguably the goal or role of accountability. How assessments affect instruction or curriculum is a key concern and leads to the issue of alignment between standards and assessments. Unless this alignment is clear, the results of accountability cannot be reliable.

For the assessments and the accountability system to support the overall goals of improving student learning and school improvement, the assessments must measure the standards. Unfortunately, the language of “standards” is not always easily applied to assessment or measurement. Work must be done to translate the standards into a form that is conducive to assessment, yet does not compromise academic expectations. This can be achieved in multiple ways and has been accomplished in Nevada using the following method (See Figure 3).

Figure 3 — Translation is One Step in the Alignment



The articulation of standards into a form appropriate for school- and classroom-level assessments is needed for a variety of reasons. First of all, it provides a clear plan for developing test items and tasks. This gives some assurance that, at the state level, measurements are aligned with expected proficiency of student performance based on the state standards. In addition, it supports the development of school district or classroom assessments that are aligned to both the state academic expectations and other forms of assessment that comprise the total assessment system. Aligning different types of assessments is required to achieve systemic reform.

The articulation of standards, ultimately in the form of assessment, also helps serve another critical purpose. It communicates what is expected from students in the form of knowledge and skills acquisition as well as what is expected from schools in terms of curriculum and instructional delivery. In addition, students, parents, and teachers must know how students will be assessed and the decisions that will be made based on their performance.

One of the critical features of the interpretation of standards in Nevada has been the prioritization of standards. After the standards were written and adopted, a statewide committee of district-nominated educators were brought together to make decisions regarding the assessment of the standards. Groups of teachers and other educators had the task of taking each standard and objective and noting whether it was indicative of being *enduring* (i.e., essential knowledge and skills students need to internalize and retain), *important* (i.e., knowledge and skills students need to expand their understanding, make connections, and comprehend new or unfamiliar information), or *worthwhile* (i.e., students should be familiar with key concepts, ideas, facts, and terms). Next, educators made decisions as to whether a standard/objective might best be assessed at the state or local level. This process resulted in a clear subset of standards and objectives that were denoted as being enduring or important as well as testable at the state level.

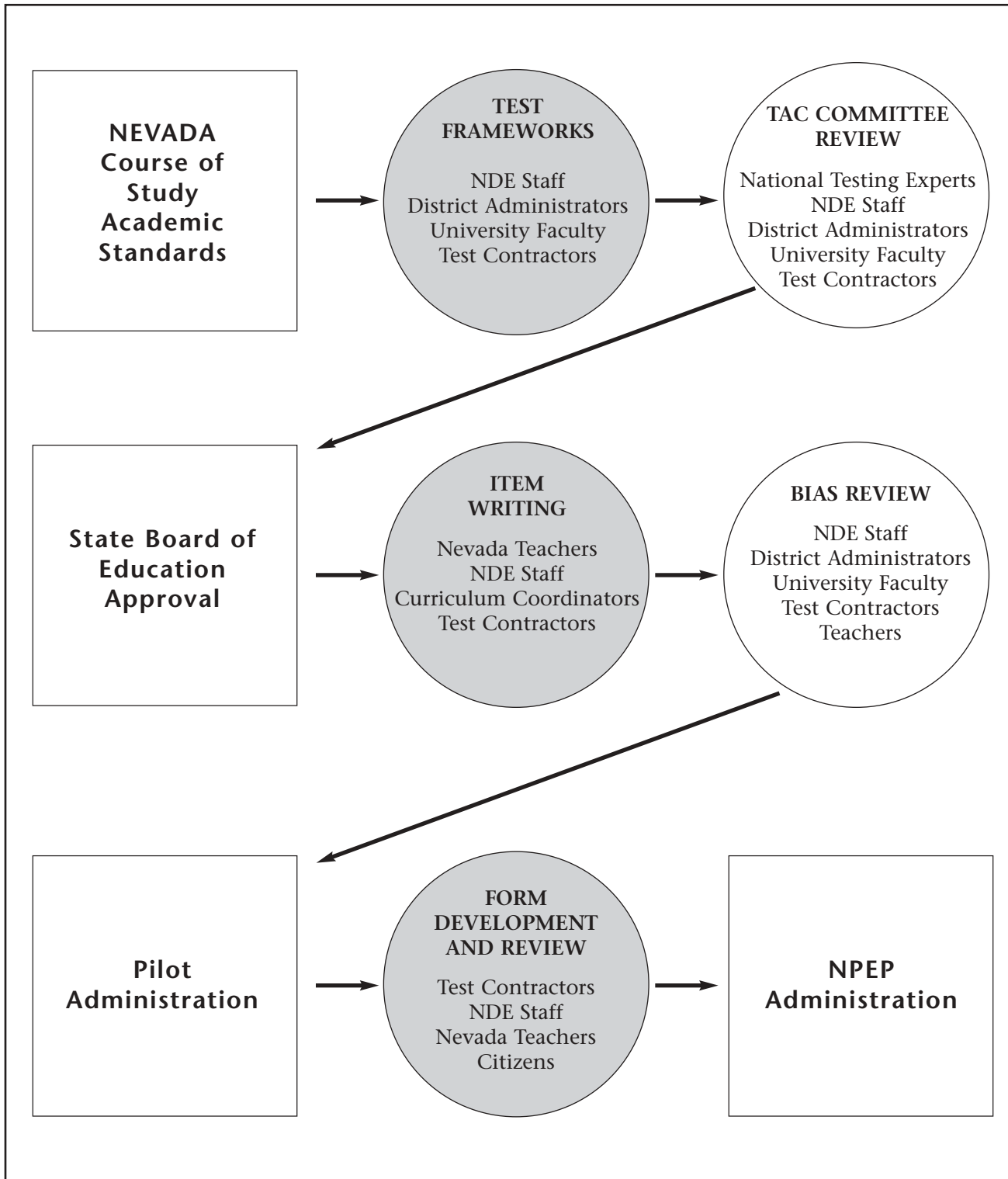
The prioritization process is important for several reasons. First, the breadth and depth of the Nevada Content Standards make it very difficult to provide a comprehensive assessment. Second, although a lengthy assessment process might be seen as optimal, cost and time spent testing are practical constraints. Third, the prioritization process allows for a finer distinction in those aspects of the standards that are essential for state assessment. This, of course, is a critical undertaking. As stated previously, testing will direct curriculum and instruction, and any narrowing of curricular scope could be detrimental to including all the standards in classroom instruction. It is important to note that the prioritization process did not exclude any of the standards/objectives from assessment. Instead, it called for the assessment of all standards/objectives at the local level, and a specified set of knowledge/skills to be assessed at the state level.

Development

The cornerstone of the test development process of the Nevada Proficiency Examination Program is teacher involvement in the writing and reviewing of test items. This test-building process for state assessments is comprehensive and involves national and local educators, as well as technical assistance from regional education laboratories and testing contractors. Prior to writing items, teachers are provided thorough training designed to assist them in writing quality items that are free from bias and clearly aligned to specific prioritized content standards. Throughout item writing sessions, time is dedicated to peer-review of item drafts, which includes validating the matched items to specific content skills.

Figure 4 illustrates the development process for test items. It begins with the state standards and the construction of test frameworks and specifications for them, followed by a review of these documents by a Technical Advisory Committee (TAC) and policy boards. After approval from the Nevada Board of Education, educators who have been nominated by district administrators from around the state begin the item writing process, which includes the construction of items/tasks and the qualitative bias review of test items/tasks and reading passages. Items are analyzed to ensure they do not convey insensitivity to a particular group, violate privacy issues, or differentially impact opportunity and access. A variety of educators and other citizens are involved in the review process with the goal of building a culturally diverse team that is representative of the state population, with teachers always serving in this primary role. Reliance on teacher involvement in the writing and review process provides confidence that the state assessments accurately measure content being taught in Nevada classrooms. Once written and reviewed, items are field tested with Nevada students. Based on a statistical and qualitative review of the field-tested items, test forms are constructed, submitted for a comprehensive review, and ultimately formally administered to students.

Figure 4 — The NPEP Development Process



Reporting

In order for assessments to serve the purposes of improving student learning and classroom instruction, assessment results must be reported in a manner that facilitates the interpretation of student performance. The reporting of results must be tied directly to the expectations for student learning.

The state will provide a variety of score reports in paper format including student, school, district, and state level summary reports. Additionally, “raw” data will be provided to school districts in electronic format to allow for more precise analyses. The integration of results from the multiple levels of assessment (i.e., state vs. classroom) will require the use of electronic media. The state is currently pursuing the adoption of web-based reporting software that can make the “raw” data available in varying degrees of specificity to all education stakeholders. In particular, teachers would be able to access data representing their own classroom, school, and/or district.

Although the electronic transfer of results is optimal, the paper reports disseminated by the state must still convey important information with clarity. The student level summary report will convey both diagnostic and general achievement information. It will provide information pertaining to the number of items possible, the number of items correct, and the percentage of items answered correctly relative to a particular content standard (i.e., in Reading, *Read to Comprehend, Interpret and Evaluate Literature*, or in Math, *Algebra and Functions*). In addition, it will provide information on the cognitive domain (i.e., in Reading, *Developing an Interpretation* or in Math, *Procedural Knowledge*).

The scale score obtained by the student will be specified at the top of the score sheet and a key will be provided at the bottom qualifying the achievement levels by descriptors of the scale scores, i.e., emerging/developing, approaching standard, meeting standard, or exceeding standard. The scale score is derived by mapping each raw score to a scale score through a linear transformation process where student ability, test difficulty, and student guessing are factored into the equation. The cut scores of 200 for Approaches Standard and 300 for Meets Standard were established during the Nevada Standard Setting process in 2003. The Exceeds Standard cut is also fixed, but may vary minimally for each test. While the raw score percentage correct required to attain each achievement category may change from year to year and may differ from subject to subject, the scale score cuts remain constant. As a result, for some test forms or subjects, students could receive relatively high percentages of correct answers and not meet the standard, while with other forms they could receive relatively moderate scores and could meet or even exceed the standard, depending on the difficulty of the test form and the achievement level cuts established in the standard setting process.

The number/percentage correct information provided on the Student-Level Summary Score Report has limited diagnostic value. For a particular administration, it does indicate performance relative to the more specified content areas; but the limited number of questions related to any particular standard or domain, in addition to the number of skills encompassed within the standard, prevents a highly reliable estimate of performance. However, if this information is combined with classroom-based information, a strong diagnostic picture can be created. For example, if a student correctly answers 5 of 10 items pertaining to Numbers and Number Sense on the state test, it would suggest some relative weakness. However, because each test form is but a sampling of content from the standards, it is important to validate the state level performance information with classroom level information relative to Numbers and Number Sense (assignment grades, class quizzes, teacher observation, etc.) before major remedial efforts would be implemented for any student.

The school summary report will communicate similar information. The report will convey raw performance in terms of the school’s average percent correct relative to each content standard and cognitive domain. The report will provide a standard-by-standard, domain-by-domain comparison between the school and the school district as well as a bar chart denoting a comparison between the school and the district in terms of pass rates. Disaggregated data on student performance by major subpopulations will also be provided. This will include average scale score performances as well as pass rates by gender, major ethnic groups, students with disabilities, students with limited English proficiency, and students with low socio-economic status.

READING INTRODUCTION



READING INTRODUCTION

All students must have the opportunities and resources to develop the language skills they need to pursue life's goals and to participate fully as informed, productive members of society.

— **National English/Language Arts Standards**

<http://www.ncte.org/about/over/standards/110846.htm>



The goals of English/Language Arts education in Nevada emphasize the importance of students becoming proficient readers and writers. As students learn literacy skills, they must understand and practice effective reading strategies for a variety of purposes in a range of genres. Students must read often, interpreting and evaluating a broad range of classic and contemporary literature. They should also be active, critical consumers of media and technology information. Students should know how to evaluate and summarize information and communicate their conclusions clearly to others. They must be able to develop, organize, and conventionally present their ideas logically and effectively in written and oral formats.

The Nevada English Language Arts Standards provide a comprehensive conceptual framework within which explicit content is identified in a K-12 sequence of study. The criterion-referenced test in reading is designed to align the assessment system with instruction.

Nevada's Content and Performance Standards in English Language Arts are composed of 11 standards, four of which are tested in the reading portion of the criterion-referenced tests at grade 8. Content Standards 1 through 4 deal with students' abilities to use word analysis, reading process, and comprehension skills. Each standard has performance indicators that target specific competencies within the standard. The following is a description of the standards and those performance indicators tested. Those tested at the state level are check marked.

Nevada English Language Arts Standards and Progress Indicators

Standard 1: Students know and use word analysis skills and strategies to comprehend new words encountered in text.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Apply knowledge of Greek- and Latin-derived roots and affixes to determine the meaning of unknown words and to increase vocabulary.
- ✓ Apply knowledge of word origins, roots, structures, and context clues, as well as use dictionaries and glossaries, to comprehend new words in text.
- ✓ Analyze idioms, analogies, metaphors, and similes to infer literal and figurative meaning.

Standard 2: Students use reading process skills and strategies to build comprehension.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Apply and analyze the use of appropriate pre-reading strategies that enhance comprehension, such as accessing prior knowledge, predicting, previewing, and setting a purpose.
- Choose reading strategies and self-correct to enhance comprehension.
- ✓ Apply and analyze a variety of skills and strategies such as locating essential information, verifying predictions, drawing conclusions, and making inferences to aid comprehension.
- Use outlines, maps, and graphic organizers to aid comprehension.
- Adjust reading rate to match purpose, task, and text difficulty.

Standard 3: Students read to comprehend, interpret, and evaluate literature from a variety of authors, cultures, and times.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Evaluate story elements such as character, conflict, plot, subplot, parallel episodes, and climax to determine their importance to a story.
- ✓ Make inferences and predictions supported by the text regarding the motives of characters and consequences of action.
- Explain an author's viewpoint and message in relation to the historical and cultural context of the author or work.
- ✓ Distinguish theme from topic, identify possible themes, and pinpoint recurring themes in several selections, citing textual evidence to support claims.
- ✓ Analyze ways authors use imagery, figurative language, and sound to elicit reader response.
- Compare stylistic elements among texts to determine effects of author choices.
- Compare characteristics and elements of various literary forms, including short stories, poetry, essays, plays, speeches, and novels.

Standard 4: Students read to comprehend, interpret, and evaluate informational texts for specific purposes.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Use knowledge of text features and common expository structures such as cause/effect and comparison/contrast to comprehend text.
- ✓ Locate, interpret, organize, and synthesize information from texts to answer specific questions and support ideas.
 - Identify and assess the validity, accuracy, and adequacy of evidence that supports an author's ideas.
- ✓ Summarize authors' ideas and information in texts, including advertisements and public documents.
 - Read and follow multi-step directions to complete a complex task.

THE NEVADA CRITERION REFERENCED TESTS

The Nevada Criterion Referenced Tests (CRT) in reading are passage-based. That is, all items (questions) are connected to an extended piece of written text. Because reading passages form the basis for assessing reading comprehension, there are certain considerations that guide the selection of the texts, including genre, passage length, and readability.

In assessing reading, it is important to provide opportunities for students to respond to different types of reading materials for different purposes. Reading passages found in the CRT reading examination may be literary, informational, or functional text. Passage length will range from 900 to 1080 words for grade 8. Poems may be shorter than the minimum number of words designated, and pairing of two short passages may occur. The pairing of passages provides opportunities to assess analysis skills and also supplies enough text from which to construct the desired number of items per passage.

Besides being familiar with a range of reading genres, the readability levels of the passages must be consistent with grade-level appropriateness as well as with the reading purpose. Readability levels are determined through many variables: format, typography, content, literacy form and style, vocabulary difficulty, sentence complexity, concept load or density, cohesiveness, etc. Readability formulas are run on each passage; however, teacher expertise is the final determinate of grade-level appropriateness.

Since previously published text is used for the passages on the test, some texts may not follow grammar or usage rules students are taught to use in their own writing. The passage must be printed exactly as it was published unless the copyright holder gives permission for changes to be made.

The following is a description of each type of passage found in the reading portion of the criterion-referenced tests.

Literary Text – is writing that is read for enjoyment, entertainment or inspiration. The text may include short stories, literary essays, poems, historical fiction, fables, folk tales, plays, or excerpts from novels. If excerpts are selected, they must have a discernable beginning, middle, and end. The passages should reflect a variety of themes appropriate for and interesting to students at the designated grade level.

Informational Text – is writing that is read for a purpose and is similar to what students see in textbooks everyday. It is read in order to solve problems, raise questions, provide information, or present new ideas. Informational passages may be drawn from magazines, newspaper articles, diaries, editorials, essays, biographies, and autobiographies. These selections should have readily identifiable key concepts and relevant supporting details. Informational passages should include a variety of grade-appropriate information sources, both primary and secondary.

Functional Text – is writing that is encountered in everyday life both inside and outside of the classroom. It includes consumer materials, how-to instructions, advertisements, and tables and graphic presentations of text.

The items that are used to evaluate understanding of these passages fall into three Ability Levels (Cognitive Domains) that are reported on the reading assessments.

The following charts show the Content Clusters and Ability Levels (Cognitive Domains).

Content Clusters

C1 – Word Analysis and Skills (Standard 1)

C2 – Comprehend, Interpret, and Evaluate Literature (Standard 3)*

C3 – Comprehend, Interpret, and Evaluate Informational Texts (Standard 4)*

* While not reported separately, some items in C2 and C3 assess students' ability to use reading process strategies in the Standard 2 performance indicators.

Ability Levels (Cognitive Domains)

A1 – Form an Initial Understanding

A2 – Develop an Interpretation

A3 – Demonstrate a Critical Stance

Forming an Initial Understanding (A1)

Questions at this level assess the student's knowledge of the initial understanding of what is read. For A1 questions, the answers can be found directly in the text or as a simple statement of information found in the text. Some examples are:

- Which word has the same vowel sound as...?
- What event happened for the first time in...?
- Choose the correct list of materials needed to play...
- Which sentence is a fact?

Developing an Interpretation (A2)

Questions at this level assess the ability to extend initial understanding to develop a more complete understanding of what is read. This process may involve linking information across parts of a text as well as focusing on specific information. Questions that assess this aspect of reading include drawing inferences about the relationship of two pieces of information and providing evidence to determine the reason for an action. Some examples are:

- How did...feel about the story?
- What is an opinion?
- The directions say to..., so
- What is a simile?

Determining a Critical Stance (A3)

Questions at this level require students to stand apart from the text, consider the entire text objectively, and evaluate its quality and appropriateness. Examining text content and structure requires critically evaluating, comparing/contrasting, and understanding the effect of such features as irony, humor, and organization. Some examples are:

- Another good title for this story is...
- The author of this passage would probably agree with
- What is the main idea of this passage?
- Which was the main event of this passage?

The matrix below explains the configuration of the reading examination at grade 8.

CRT Grade 8 Reading Examination Item Matrix					
Content Cluster/ Ability Level (Cognitive Domain)	C1 Word Analysis (Standard 1)	C2 Comprehend Literature (Standards 2 & 3)*	C3 Comprehend Informational Text (Standards 2 & 4)*	Total Items	Percent
A1 Initial Understanding	4	5	9	18	33
A2 Interpretation	7	9	10**	26	48
A3 Critical Stance	0	5***	5	10	19
Total Items	11	19	24	5	
Percent	20	35	45		100

* Standard 2 (Reading process strategies) is assessed in Reporting Cluster 2 with Standard 3 (Comprehend...literature) and in Reporting Cluster C3 with Standard 4 (Comprehend...informational text), but no separate score is given for Standard 2.

** Indicates a constructed-response item.

*** Indicates 2 constructed-response items.

Constructed-Response Items

Constructed-response items present students with a question or questions that require students to respond in written form. Typically items ask students to not only recall knowledge from a passage, but also demonstrate more complex cognitive behaviors such as organizing, summarizing, comparing, relating, analyzing, inferring, concluding, predicting, solving, and/or applying. A constructed-response item can appear in several different formats and reflect either the A2 or A3 Ability Level. An item may be specific in its request (e.g., “Describe three different ways that...”) or more open-ended (e.g., “Describe different ways that...and explain why...”).

Constructed-responses will have a set, which scaffolds the student’s thinking, and directions for the task.

Students receive a score of 0-3 points on their answer, with 0 being the lowest and 3 being the highest. A score of 2 or 3 is deemed proficient. A student’s score depends on how closely his or her answer matches the description in the item-specific rubric and the anchor papers for each constructed-response item.

For each constructed-response item, an item specific rubric is designed based on the general rubric. (See below for example.) Anchor papers, which are exemplary responses of typical student responses at each score point, are selected to guide the trained readers who score students' responses.

Score Point	Expectation
3	<p>The response completely answers all parts of the question and displays thorough understanding of the skill(s) being tested. The response provides an answer that:</p> <ul style="list-style-type: none"> • shows an accurate understanding of the text. • gives sufficient relevant details from the passage to support the answer.
2	<p>The response partially, but adequately, answers the question and displays satisfactory understanding of the skill(s) being tested. The response provides an answer that:</p> <ul style="list-style-type: none"> • shows a basic understanding of the text. • gives some relevant details from the passage to support the answer; however, it may give some details from the passage that do not support the answer.
1	<p>The response demonstrates a limited understanding of the skill(s) being tested. The response provides an answer that:</p> <ul style="list-style-type: none"> • indicates a lack of understanding of the text or of the intent of the question. • provides few, if any, relevant details from the passage to support the answer; however, it may give some unrelated details or inaccuracies about the passage.
0	<p>The response demonstrates a lack of understanding of the skill(s) being tested. The response provides an answer that:</p> <ul style="list-style-type: none"> • is unrelated to the question or repeats the question without adding anything to show understanding of the question or the passage. • is incorrect based on information in the passage.



GRADE 8 READING

Reporting Category:	C1 – Word Analysis Skills and Strategies
Ability Level:	A2 – Developing an Interpretation
Performance Indicator:	Apply knowledge of word origins, root, structures, and context clues, as well as dictionaries and glossaries, to comprehend new words in text.
Passage:	<i>Sounding the Alarm</i> (See page 37 in this guide to read the passage.)
Test Item:	

In paragraph 7, what does the word eradicate mean?

- A destroy completely
- B scare away
- C capture for study
- D control the population

Correct Response A:	The sentences before and after the word “eradicate” discuss how the chemical killed whatever it touched – flies, mosquitoes, songbirds, etc.
Response B:	This response is incorrect. Some students may choose this response because the scientist sprayed the chemical to get rid of the insects, which could mean the insects were disturbed by the spray and migrated to another place.
Response C:	This response is incorrect. Some students may choose this response because the selection discusses scientific studies of the effects of the chemical on living organisms in the environment.
Response D:	This response is incorrect. Some students may choose this response because the selection refers to chemical spraying on the population of disease bearing insects that made people sick. However the text explicitly states that the intent was to wipe them out, not to control their numbers.

GRADE 8 READING

Reporting Category:	C2 – Read to comprehend, Interpret and Evaluate Literature
Ability Level:	A1 – Forming an Initial Understanding
Performance Indicator:	Apply and analyze a variety of skills and strategies such as locating essential information, verifying predictions, drawing conclusions, and making inferences to aid in comprehension.
Passage:	<i>The Bell of Atri</i> (See page 27 in this guide to read the passage.)

Test Item:	When the horse rang the bell, the judges went to the marketplace in order to A close the gates to the marketplace. B bring food for the horse. C replace the vine the horse had eaten. D hear the bell ringer's complaint.
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Correct Response D:	The responsibility of the judges in the story was to come to the marketplace when the bell rang and hear the complaints of those who had been wronged so they could mete out justice.
Response A:	This response is incorrect. Some students may select this response because the story says the gates to the marketplace were wide open, and the horse went in.
Response B:	This response is incorrect. Some students may select this response because the text states that everyone knew the horse was sick and hungry and students may think the judges knew who was ringing the bell and so they were bringing food for the horse.
Response C:	This response is incorrect. Some students may choose this response because the horse was nibbling on the vine and thus it might need to be replaced.

GRADE 8 READING

Reporting Category:	C2 – Read to Comprehend, Evaluate, and Interpret Literature
Ability Level:	A2 – Developing an Interpretation
Performance Indicator:	Analyze ways authors use imagery, figurative language, and sound to elicit reader response.
Passage:	<i>Migration of the Raptors</i> (See page 31 in this guide to read the poem.)
Test Item:	

In line 3, the author writes “... a painter’s palette smeared across the land——.” This means that

- A the speaker is painting a picture.
- B the landscape is colorful.
- C the trees look as if they are painted.
- D the shore looks messy.

Correct Response B:	The figurative language in the sentence means that the countryside is beautifully colorful like a picture.
Response A:	This response is incorrect. Some students may choose this response because the figurative language refers to a painter’s palette and they may assume the speaker in the poem may be painting a picture.
Response C:	This response is incorrect. Some students may choose this response because the poem mentions the many colors of the trees and a painter’s palette.
Response D:	This response is incorrect. Some students may choose this response since the figurative language refers to the palette being smeared across the land and assume that the shoreline scene is messy.

GRADE 8 READING

Reporting Category: C2 – Read to Comprehend, Evaluate, and Interpret Literature

Ability Level: A3 – Demonstrating a Critical Stance

Performance Indicator: Evaluate story elements such as character, conflict, plot, subplot, parallel episodes, and climax to determine their importance to a story.

Passage: *The Bell of Atri* (See page 27 in this guide to read the passage)

Test Item:

**Write your answer to Question # on Page # in your Answer Booklet.
Be sure to answer Parts A and B.**

The theme of the story is that justice comes from people living up to their obligations.

- A Using details from the story, explain why the author uses the knight and his horse to illustrate the theme.
- B Determine the author's success in illustrating the theme in the story.

Score Point	Expectation
3	Response thoroughly and accurately explains the author's purpose for using the knight and his horse to illustrate the theme of the story and describes the author's success in conveying the theme. The response includes relevant supporting details from the passage.
2	Response adequately explains the author's purpose for using the knight and his horse to illustrate the theme of the story and describes the author's success in conveying the theme. The response includes some relevant details from the passage, but it may contain some inaccuracies.
1	Response attempts to explain the author's purpose for using the knight and his horse to illustrate the theme of the story and may or may not describe the author's success in conveying the theme. The response may contain numerous inaccuracies or misunderstandings about the passage. Few, if any, relevant details from the passage are provided.
0	Response is totally inaccurate and/or irrelevant.

GRADE 8 READING

Sample Response for Each Score Point:

- 3 – The author chose the knight and his horse to illustrate the theme of this story about justice coming from people living up to their obligations to one another because the old knight, even though his horse was his best friend and saved him from danger when they were younger, showed no responsibility to the horse when they got older. He was only interested in collecting more and more money and decided that he didn't want to spend his money to care for the horse anymore. The knight turned the horse loose on the hill where there wasn't much grass, and the horse got sick and skinny. Since the knight wronged the horse and didn't live up to his responsibilities to the horse, the horse deserved justice. I think that the knight was very successful in showing the theme of this story because since the knight did not live up to his responsibilities to the horse, he was judged and punished and the horse got justice.
- 2 – The author used the knight and the horse to show the theme of this story about being responsible because the knight wasn't nice to the horse when it got old. He turned the horse out to eat grass instead of keeping him and feeding him. This made the horse feel bad because the knight was not being responsible to him. When the horse was looking for food, he found the marketplace and ate the green vine. So the bell rang and the judges came. They saw he was hungry and decided to give him justice by feeding him, and they punished the knight. That showed the knight that he should have been responsible. I think that the author was successful in telling about the theme of this story because the knight didn't show any responsibility to the horse and the horse had to tell on him and get justice.
- 1 – The author used the knight and the horse to tell about the theme of the story because he was good friends with him. The knight learned that he should have taken care of the horse and the horse learned that there wasn't much grass to eat on the hill. The story showed justice for the knight and the horse. I think that the author was successful in writing this story because we read it in this test book, so it was printed.
- 0 – The author liked the knight and the horse. He wrote a story about them.

GRADE 8 READING

Reporting Category: C3 – Read to Comprehend, Interpret, and Evaluate Informational Text

Ability Level: A3 – Demonstrating a Critical Stance

Performance Indicator: Summarize authors' ideas and information in texts, including advertisements and public documents.

Passage: *Sounding the Alarm* (See page 37 in this Guide to read the passage.)

Test Item:

One main impact of Carson's book "Silent Spring" was that it showed that

- A the use of pesticides is of most interest to scientists.
- B the debate over pesticide use will be easily settled.
- C there are unintended effects of pesticide use.
- D the reduction of pesticide use will save our environment.

Correct Response C: The second paragraph indicates that this was a lasting impact of Carson's work.

Response A: This response is incorrect. The article states that after the book was published there was a furious public debate on this issue.

Response B: This response is incorrect. The article indicates the argument over pesticide use continues to rage.

Response D: This response is incorrect. The article does not suggest that limiting the use of pesticides will save our environment.

GRADE 8 READING

Reporting Category:	C2 – Read to Comprehend, Interpret, and Evaluate Literature
Ability Level:	A3 – Demonstrating a Critical Stance
Performance Indicator:	Make inferences and predictions supported by the text regarding the motives of characters and consequences of action.
Passage:	<i>Migration of the Raptors</i> (See page 31 in this Guide to read the poem.)
Test Item:	

At the end of the poem, the speaker can **best** be described as

- A hopeful.
- B inspired.
- C disappointed.
- D weary.

Correct Answer B:	The speaker finally sees an eagle and that vision will “carry us through the coming days.”
Response A:	This response is incorrect. Students may choose this response because verse three states “in hopes of glimpsing the majesty of an eagle.”
Response C:	This response is incorrect. Students may select this response because at one point the speaker and his friend had seen nearly a hundred hawks, but they had not yet seen an eagle.
Response D:	This response is incorrect. Students may choose this response because the speaker and his friend spent an entire day waiting to see an eagle. The students could assume that this would be very tiring.

GRADE 8 READING

Reporting Category:	C3 – Read to Comprehend, Interpret and Evaluate Text
Ability Level:	A2 – Developing an Interpretation
Performance Indicator:	Select and use a variety of skills and strategies during reading, such as identifying fact and opinion or cause and effect, verifying predictions, summarizing, paraphrasing, drawing conclusions, to aid in comprehension.
Passage:	<i>Sounding the Alarm</i> (See page 37 in this Guide to read the selection.)
Test Item:	<p>According to the selection, which of these events most helped awaken the nation to some of the effects of chemicals on the environment?</p> <p>A the B-25 bombers spraying DDT in the jungles during World War II</p> <p>B a drug used on pregnant women that was found to cause birth defects</p> <p>C a chemical company threatening to sue because of Carson’s claims</p> <p>D a woman finding dead birds in her yard after her area had been sprayed</p>
Correct Response B:	This finding came out as excerpts for <i>Silent Spring</i> were being released in the <i>New Yorker</i> and just before the book on the whole was released. Newspapers and magazines were running photos of deformed babies. The author puts it this way: “Suddenly in a single summer, chemical science had fallen from its pedestal.”
Response A:	This actually was cited as a reason to support chemical spraying, for the practice was credited with saving untold lives.
Response C:	Irrelevant to awakening the public.
Response D:	A true event, but too narrowly focused to have national impact.

GRADE 8 READING

Reporting Category: C3 – Read to Comprehend, Interpret, and Evaluate Text
Ability Level: A1 – Forming an Initial Understanding
Performance Indicator: State facts and details in text to share information and organize ideas.
Passage: *Sounding the Alarm* (See page 37 in this Guide to read the selection.)

Test Item:

Based on information in the selection, Carson believed that pesticide use

- A should be eliminated.
- B should be reduced.
- C could be increased if there were safer pesticides.
- D would be safe if people did not question it.

Correct Response B: Carson's own clarification is in paragraph 16: "She insisted she was not against all pesticides and had never called for banning them, only for restricting their use."

Response A: The selection indicates that Carson did not ever suggest that pesticides be completely banned.

Response C: The selection mentions that pesticide use today is greater than what it was in Carson's day. It also mentions that today's pesticides are generally safer on the environment. But it says nothing to indicate that Carson would endorse increased use of pesticides.

Response D: The selection implies that in Carson's day people had not questioned pesticide use. It was her work that was part of the process that got people to begin asking questions.

GRADE 8 READING

Reporting Category: C2 – Use Reading Process Skills and Strategies to Build Comprehension

Ability Level: A2 – Developing an Interpretation

Performance Indicator: Apply and analyze a variety of skills and strategies such as locating essential information, verifying predictions, drawing conclusions, and making inferences to aid comprehension

Passage: *Migration of the Raptors* (See page 31 in this Guide to read the poem.)

Test Item:

The speaker has come to Lake Superior in order to

A look at different trees.

B enjoy the cool air.

C learn to be a bird watcher.

D see an eagle soar.

Correct Answer D: The speaker states in lines 19 and 20, “It is here that a friend and I have come in hopes of glimpsing the majesty of an eagle.”

Response A: This response is incorrect. Students may choose this response because trees are the subject of the first stanza. The beauty of the trees is described, but that is not the motivation for the visit to Lake Superior.

Response B: This response is incorrect. Students may select this response because the month is September and the birds are migrating.

Response C: This response is incorrect. Students may choose this response because the second stanza and part of the third describe the birds the speaker sees flying above the lake.

The Bell of Atri

Retold by James Baldwin

Atri is the name of a little town in Italy. It is a very old town and is built halfway up the side of a steep hill.

A long time ago, the King of Atri bought a fine large bell and had it hung up in a tower in the marketplace. A long rope that reached almost to the ground was fastened to the bell. The smallest child could ring the bell by pulling upon this rope.

"It is the bell of justice," said the King.

When at last everything was ready, the people of Atri had a great holiday. All the men and women and children came down to the marketplace to look at the bell of justice. It was a very pretty bell and was polished until it looked almost as bright and yellow as the sun.

"How we should like to hear it ring!" they said.

Then the King came down the street.

"Perhaps he will ring it," said the people. And everybody stood very still and waited to see what he would do.

But he did not ring the bell. He did not even take the rope in his hands. When he came to the foot of the tower, he stopped, and raised his hand.

"My people," he said, "do you see this beautiful bell? It is your bell. But it must never be rung except in case of need. If any one of you is wronged at any time, he may come and ring the bell. And then the judges shall come together at once, and hear his case, and give him justice. Rich and poor, old and young, all alike may come. But no one must touch the rope unless he knows that he has been wronged."

Many years passed by after this. Many times did the bell in the marketplace ring out to call the judges together. Many wrongs were righted, many ill-doers were punished. At last the rope was almost worn out. The lower part of it was untwisted; some of the strands were broken; it became so short that only someone tall could reach it.

"This will never do," said the judges one day. "What if a child should be wronged? It could not ring the bell to let us know it."

They gave orders that a new rope should be put upon the bell at once—a rope that should hang down to the ground so that the smallest child could reach it. But there was not a rope to be found in all Atri. They would have to send across the mountains for one, and it would be many days before it could be brought. What if some great wrong should be done before it came? How could the judges know about it, if the injured one could not reach the old rope?

"Let me fix it for you," said a man who stood by.

He ran into his garden, which was not far away, and soon came back with a long grapevine in his hands.

"This will do for a rope," he said. And he climbed up and fastened it to the bell. The slender vine, with its leaves and tendrils¹ still upon it, trailed to the ground.

READING SAMPLE TEST PASSAGE

“Yes,” said the judges, “it is very good rope. Let it be as it is.”

Now, on the hillside above the village, there lived a man who had once been a brave knight. In his youth he had ridden through many lands, and he had fought in many a battle. His best friend through all that time had been his horse—a strong, noble steed that had borne him safe through many a danger.

But the knight, when he grew older, cared no more to ride into battle; he cared no more to do brave deeds; he thought of nothing but gold; he became a miser². At last he sold all that he had, except his horse, and went to live in a little hut on the hillside. Day after day he sat among his moneybags and planned how he might get more gold. And day after day his horse stood in his bare stall, hungry and shivering with cold.

“What is the use of keeping that lazy steed?” said the miser to himself one morning. “Every week it costs me more to keep him than he is worth. I might sell him, but there is not a man who wants him. I cannot even give him away. I will turn him out to shift for himself and pick grass by the roadside . . . ”

So the brave old horse was turned out to find what he could among the rocks on the barren hillside. Lamé and sick, he strolled along the dusty roads, glad to find a blade of grass or a thistle. . . . the dogs barked at him, and in all the world there was no one to pity him.

One hot afternoon, when no one was upon the street, the horse chanced to wander into the marketplace. Not a man nor child was there, for the heat of the sun had driven them all indoors. The gates were wide open; the poor beast could roam where he pleased. He saw the grapevine rope that hung from the bell of justice. The leaves and tendrils upon it were still fresh and green, for it had not been there long. What a fine dinner they would be for a hungry horse!

He stretched his thin neck and took one of the tempting morsels in his mouth. It was hard to break it from the vine. He pulled at it, and the great bell above him began to ring. All the people in Atri heard it. It seemed to say,

Someone has done me wrong!

Someone has done me wrong!

Oh! come and judge my case!

Oh! come and judge my case!

For I've been wronged!

The judges heard it. They put on their robes and went out through the hot streets to the marketplace. They wondered who it could be who would ring the bell at such a time. When they passed through the gate, they saw the old horse nibbling at the vine.

“Ha!” cried one, “it is the miser’s steed. He has come to call for justice. For his master, as everybody knows, has treated him most shamefully.”

“He pleads his cause as well as any animal can,” said another.

“And he shall have justice!” said a third.

Meanwhile a crowd of men and women and children had come into the marketplace, eager to learn what cause the judges were about to try. When they saw the horse, all stood still in wonder. Then everyone was ready to tell how they had seen him wandering on the hills, unfed, uncared for, while his master sat at home counting his bags of gold.

¹ *tendrils* – long, curling parts of a stem

² *miser* – a stingy person

READING SAMPLE TEST PASSAGE

“Go bring the miser before us,” said the judges.

And when he came, they bade him stand and hear their judgment.

“This horse has served you well for many a year,” they said. “He has saved you from many a peril. He has helped you gain your wealth. Therefore we order that one half of all your gold shall be set aside to buy him shelter and food, a green pasture where he may graze, and a warm stall to comfort him in old age.”

The miser hung his head and grieved to lose his gold. But the people shouted with joy, and the horse was led away to his new stall and a dinner such as he had not had in many a day.

In the public domain.

READING SAMPLE TEST QUESTIONS

1 The King of Atri could **best** be described as

- A greedy.
- B impatient.
- C harsh.
- D caring.

2 When the judge says "He pleads his cause as well as any animal can," the judge is referring to the horse

- A being there all alone.
- B standing in the hot sun.
- C pulling on the leafy vine.
- D wandering into the marketplace.

3 When the King tells the people of Atri the bell can only "...be rung in case of need," he means if a person has

- A run out of money.
- B bought a new rope.
- C been found guilty.
- D been dishonored.

4 In paragraph 32, the old knight is told that his horse "...has saved you from many a peril." The word peril in this sentence means

- A danger.
- B journey.
- C adventure.
- D disappointment.

5 In the story, the author writes that when the bell was rung, "It seemed to say, 'someone has done me wrong!'"

This sentence suggests that the bell

- A is ringing too loudly.
- B has some human qualities.
- C has been damaged by the heat.
- D is ringing by itself.

6

The **best** new title for this passage would be

- A "The Brave Knight."
- B "A Tale of Justice."
- C "The King of Italy."
- D "A Busy Marketplace."

Migration Of The Raptors

1 It is September;
2 Superior's northern shore is alive with color,
3 a painter's palette smeared across the land—
4 maples flaring up in full red regalia,
5 birches blazing in lemon-bright yellow,
6 spruces and pines deepening their hues of ever-green.
7 It is a season when all the world is changing
8 and things are on the move...

9 A time when the raptors—
10 hawks, eagles, falcons and kites—
11 appear in droves in the Minnesota sky.
12 Buoyed by streams of southward flowing air,
13 the large birds move on to warmer winter grounds.
14 Some drift down from as far as the arctic,
15 sailing all the way to Argentina.
16 It is a long, difficult trek.

17 Fearful of crossing Superior's expanse,
18 the birds funnel to a thin route along her shore.
19 It is here that a friend and I have come in hopes
20 of glimpsing the majesty of an eagle.
21 In the span of a single day,
22 we have seen nearly a hundred hawks soaring,
23 the agile flight of the falcon and kite,
24 but the grace of not one eagle.

25 The somber light of the late autumn afternoon
26 begins to fill the sky and reflect off the lake.
27 This mellowing of the day reminds us
28 that there is a season just up ahead
29 that will bring us indoors
30 to savor the sights and sounds
31 of the passing year...

32 Behind us, we suddenly hear her, and turn
33 to see, tip to tip, the beating of her magnificent wings—

34 enormous wings, that will carry us through the coming days.



READING SAMPLE TEST QUESTIONS

7 The speaker uses words like “flaring” and “blazing” in the first stanza to show that

- A the trees are burning.
- B fall is nearing an end.
- C fall weather is very cold.
- D the tree colors are intense.

8 What is the mood in the fourth stanza?

- A respectful
- B doubtful
- C thoughtful
- D fearful

9 This poem is mainly about

- A the change from fall to winter.
- B the chill of autumn afternoons.
- C observing nature.
- D looking at different trees.

10 The poem suggests that

- A raptors can fly very high.
- B eagles are inspirational.
- C afternoons are depressing.
- D fall weather is very cold.

11 How much time does the speaker spend at Lake Superior?

- A all day
- B a week
- C several hours
- D a month

Write your answer to Question 12 in your Answer Booklet.

12 The poem “Migration of the Raptors” tells about a time when the speaker watched raptors in Minnesota skies. Using details from the poem, explain in your own words why the experience is so special.

Preparing for hurricanes

**(Passage unavailable — Web publishing rights denied.
Please refer to printed review guide.)**

READING SAMPLE TEST PASSAGE

READING SAMPLE TEST PASSAGE

READING SAMPLE TEST QUESTIONS

13 How does the section to the right of the opening paragraph help the reader understand the selection?

- A It states the main idea of the selection.
- B It lists the main ways storms are predicted.
- C It shows how the selection is organized.
- D It asks questions the selection will later answer.

14 Based on information in the selection, one could conclude that the author believes that pets are

- A part of the family.
- B easily frightened.
- C in greater danger than people.
- D allowed to receive public aid.

15 Information about how to deal with downed electric wires would **most** likely be found under which heading?

- A *Take care of business*
- B *Last-minute tips*
- C *During the storm*
- D *Survive the aftermath*

16 Based on the selection, one could conclude that newer houses

- A leak more water than older ones.
- B withstand more wind than older ones.
- C are often located in evacuation zones.
- D require little insurance to repair.

17 The structure of this selection is intended to help the reader

- A compare different tasks.
- B find information quickly.
- C understand logical arguments.
- D know many topics thoroughly

18 According to the selection, what should be done after the hurricane has struck?

- A notify business clients
- B go to a Red Cross shelter
- C call the utility company
- D disinfect drinking water

Sounding the Alarm

by Bruce Watson

A month before World War II ended, a relatively unknown writer named Rachel Carson proposed an article for *Reader's Digest* about the effects of the pesticide DDT on what she called, "the delicate balance of nature." The shy woman assured the editors that "it's something that really does affect everybody." They turned her down. Perhaps they felt a story about pesticides would be too depressing. Or maybe it was that DDT, then widely used in the United States, had likely saved thousands of American Marines and soldiers by killing disease-carrying insects on far-off beachheads. Carson filed the subject away and went on to write best-selling books on the wonders of the sea. A dozen years later, she decided to take up the topic again. This time would be different.

While authors and publishers like to believe that a single book can change the world, few books actually have had such an impact. Yet the day it hit bookstores 40 years ago this month, Rachel Carson's *Silent Spring* fueled a vigorous public debate about the use of chemicals in our environment that has yet to be resolved. "Without this book," wrote former Vice President Al Gore in the introduction to a 1994 reprint of it, "the environmental movement might have been long delayed or never have developed at all." This complex, lyrical volume led not only to the banning of DDT but eventually to the formation of the U.S. Environmental Protection Agency. "After *Silent Spring*, people began to think about the chemicals they were handling, what they were doing to the environment, and what scientists weren't telling them," says Carson biographer Linda Lear (*Rachel Carson: Witness for Nature*, 1997). "They began to question the very direction of technology."

Carson had no intention of starting a movement. Working against time following a diagnosis of cancer, she sounded her wake-up call in the name of songbirds. "If I kept silent I could never again listen to a veery's song without overwhelming self-reproach," she wrote. But in the fall of 1962, many scientists and people in the chemical industry wished she had kept silent.

Growing up in western Pennsylvania, Rachel Louise Carson, known to friends as Ray, immersed herself in nature and books, especially the sea sagas of Melville and Conrad. At the Pennsylvania College for Women in the mid-1920s, she changed her major from English to biology, but retained a deep love of writing. Eventually she earned a master's degree in marine zoology from Johns Hopkins University and became a junior aquatic biologist for the U.S. Bureau of Fisheries in Washington, D.C. Her first book, *Under the Sea-Wind*, was published in 1941 and sold fewer than 2,000 copies. But it put her in contact with scientists who were beginning to ask hard questions about the fate of the earth.

In the late 1940s, while working as publications editor for the Fish and Wildlife Service, she began her second book, *The Sea Around Us*. The literary sensation of 1951—topping best-seller lists and winning a National Book Award—it outlined the latest science informing our understanding of the ocean. Carson almost instantly became the nation's unofficial spokesperson for the sea. "Heavens!" she wrote a friend after winning another accolade. "Is this all about me—it is really ridiculous!" *Sea's* success enabled her to become a full-time writer and buy a cottage on the coast of Maine, which would become a sanctuary for the rest of her life. While she would write another book about the sea, she continued to harbor nagging questions about the effect of pesticides on the land.

Dichlorodiphenyltrichloroethane (DDT) was first used as an insecticide in 1939. Just a few grains of the white powder would miraculously wipe out colonies of mosquito larvae. During World War II, B-25 bombers sprayed DDT prior to invasions in the Pacific. After the war, DDT would all but wipe out malaria in the developed world and drastically reduce it elsewhere. (The National Academy of Sciences reported in 1970 that DDT had saved more than 500 million lives from malaria.) Paul Müller, the chemist who first turned it on unsuspecting flies, won a Nobel Prize in 1948 for his work.

READING SAMPLE TEST PASSAGE

By the late 1950s, DDT production had nearly quintupled from World War II levels as municipal authorities took to spraying the chemical on American suburbs to eradicate tent caterpillars, gypsy moths and the beetles that carried Dutch elm disease.

But the chemical had a disturbing characteristic: it killed indiscriminately. After finding seven dead songbirds in her yard after the area had been sprayed against mosquitoes, a Massachusetts friend of Carson's wrote a letter to the *Boston Herald* in 1958 demanding that officials "stop the spraying of poisons from the air." Carson read the letter and realized that "everything which means most to me as a naturalist was being threatened." She decided to make DDT the subject of her next book, tentatively entitled *Man Against the Earth*.

But working on it in 1960, she was diagnosed with breast cancer and underwent a mastectomy. Subsequent radiation treatments left her nauseated and bedridden. The book she had expected to finish in a few months dragged on for four years. Finally, in June 1962, the first of a three-part excerpt from *Silent Spring* appeared in the *New Yorker* magazine.

Before the final installment hit newsstands, the Velsicol Corporation, which manufactured the pesticide chlordane (banned in 1988), threatened to sue the magazine for libel. "Everything in those articles has been checked and is true," replied the *New Yorker's* legal counsel. "Go ahead and sue." The company never did, but the attacks had only begun. One reader wrote that Carson's work "probably reflects her Communist sympathies."

Then, in July, news broke that a supposedly harmless drug given to thousands of pregnant women in Europe for morning sickness had been determined to cause widespread birth defects. Newspapers and magazines ran photographs of babies born without arms and legs or otherwise physically deformed. "It's all of a piece," said Carson. "Thalidomide and pesticides—they represent our willingness to rush ahead and use something new without knowing what the results are going to be."

Suddenly in a single summer, chemical science had fallen from its pedestal. By late August, reporters were asking President Kennedy if federal officials would be investigating the long-range effects of pesticides. "They already are," he answered. "I think particularly, of course, since Miss Carson's book, but they are examining the matter."

Silent Spring went on sale September 27 and raced to the top of the *New York Times* best-seller list where it stayed for most of the fall. By Christmas, the book, which begins with Carson's fable about an idyllic countryside that teemed with wildlife until "a strange blight crept over the area and everything began to change," had sold more than 100,000 copies. In subsequent chapters, the author followed the trail of pesticides from farm to family table, provided a "Who's Who" of toxic chemicals—DDT, chlordane, malathion, parathion—and noted that pesticides accumulate in fatty tissues of organisms.

Reaction to *Silent Spring* was quick, strong and largely negative, *Life* claimed that Carson had "overstated her case." *Time*, citing scientists' claims that insecticides were "harmless," dismissed it as an "emotional and inaccurate outburst." The chemical and food industries came after Carson aggressively. *Chemical and Engineering News*, a chemical industry trade magazine, linked Carson with "pseudo-scientists and faddists," denounced her "high-pitched sequences of anxieties" and belittled her credentials. The Nutrition Foundation mailed scathing reviews of the book to newspapers. The National Agricultural Chemicals Association launched a \$250,000 campaign to refute it, and the Monsanto Corporation published a parody of Carson's opening fable, describing a world without pesticides, overrun by insects and disease. In a cartoon in the November 10, 1962, issue of the *Saturday Review*, a man lamented, "I had just come to terms with fallout, and along comes Rachel Carson."

But there were voices of praise as well. Supreme Court Justice William O. Douglas called *Silent Spring* "the most important chronicle of this century for the human race."

READING SAMPLE TEST PASSAGE

While undergoing debilitating radiation treatments, Carson answered her critics. No civilization, she said, “can wage relentless war on life without destroying itself, and without losing the right to be called civilized.” She insisted she was not against all pesticides and had never called for banning them, only for restricting their use.

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READING SAMPLE TEST QUESTIONS

19 What agency did the government start in response to Carson's *Silent Spring*?

- A Environmental Protection Agency
- B Food and Drug Administration
- C Public Health Service
- D Food Quality Protection Act

20 Which **best** describes the main purpose of this article?

- A to persuade that DDT presents little danger
- B to inform about Carson's impact on environmental thinking
- C to predict that pesticides will one day be abolished altogether
- D to teach about Carson's struggles with her critics

21 According to the article, what subject area did Carson study in college?

- A environmental law
- B cancer research
- C pesticides
- D the ocean

22 Which **best** describes the relationship Carson observed between DDT and the environment?

- A cause and effect
- B compare and contrast
- C main idea and details
- D problem and solution

23 According to the article, which is true of Carson's writing?

- A It was best known for its fiction.
- B It was read by mostly scientists.
- C It was mostly autobiographical.
- D It met with little success in the beginning.

Write your answer to Question 24 in your Answer Booklet.

24 The article tells about Rachel Carson and her campaign against the use of pesticides.

Using examples from the article, describe the kind of person Rachel Carson was.

READING SAMPLE TEST ANSWER KEY

Item Number	Reporting Category	Ability Level	Answer Key
1	C2	A2	B
2	C2	A2	D
3	C2	A1	D
4	C1	A1	A
5	C2	A2	B
6	C2	A3	B
7	C1	A2	D
8	C2	A3	C
9	C2	A2	C
10	C2	A3	B
11	C2	A1	A
12	C2	A2	*
13	C3	A1	C
14	C3	A2	A
15	C3	A2	D
16	C3	A2	B
17	C3	A1	B
18	C3	A1	D
19	C3	A1	A
20	C3	A2	B
21	C3	A1	D
22	C3	A2	A
23	C3	A1	D
24	C3	A3	*

* Indicates a constructed-response item. See the following pages for the rubrics and sample responses.

READING SAMPLE TEST QUESTIONS

Rubric for Question 12

Score Point	Expectation
3	Response completely and accurately explains why this experience is significant. The response includes relevant supporting details from the passage.
2	Response explains why this experience is significant. The response includes some relevant details from the poem, but it may contain a few inaccuracies.
1	Response minimally explains why this experience is significant. The response may contain numerous inaccuracies or misunderstandings about the poem. Few, if any, relevant details from the poem are provided.
0	Response is totally inaccurate and/or irrelevant, or there is no response.

Sample Response for Each Score Point:

- 3 – The beauty of the trees, the flock of birds overhead, and the sight of an eagle make this experience very special. The leaves of the trees have turned to red and yellow and even the evergreens have darker colored needles. Hawks, falcons, and kites float overhead, drifting southward. They form a thin line as they fly along the shoreline. At last, after a day of waiting, the speaker first hears and then sees an eagle. The sight of the bird will be something to remember always. The day will be something to think about and talk about when the weather is too cold to go outdoors and the landscape is no longer full of brilliant colors or birds.
- 2 – The trees are different colors and lots of raptors fly across the sky. They are flying around the edge of the lake. The setting is beautiful and the birds are too. The person in the poem is waiting for an eagle. Finally he sees one and is happy. He likes remembering the eagle when he cannot go outside any more.
- 1 – The experience is special to the speaker. He likes the birds flying. He sees a lot of hawks. Finally he sees an eagle.
- 0 – The person lives by the lake. He is feeding the birds in the morning.

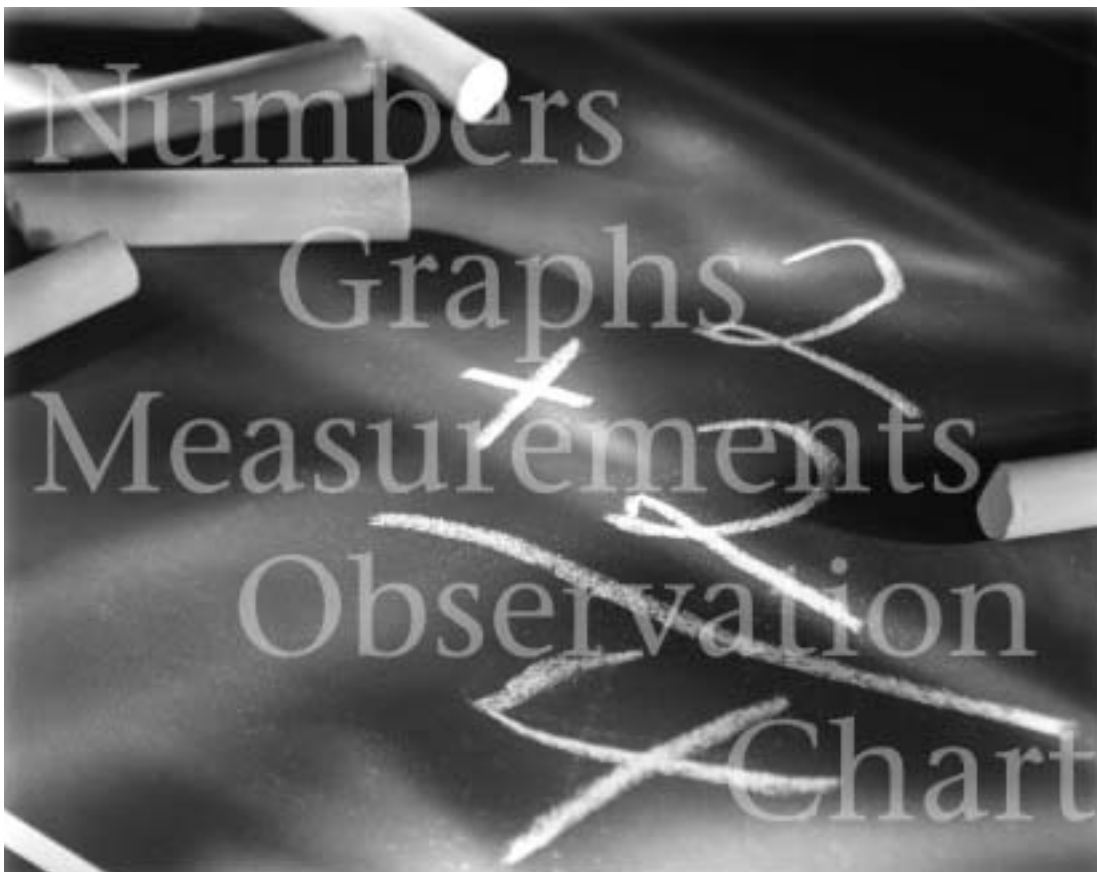
READING SAMPLE TEST QUESTIONS

Rubric for Question 24

Score Point	Expectation
3	Response thoroughly and accurately describes Carson's character and abilities. It will include many relevant supporting details from the passage.
2	Response generally describes Carson's character and abilities. Response includes some relevant details from the passage but may also contain some inaccuracies.
1	Response attempts to describe Carson's character and abilities. Response may contain numerous inaccuracies or misunderstandings about the passage. Few, if any, relevant details from the passage are provided.
0	Response is inaccurate and/or irrelevant.

Sample Response for Each Score Point:


- 2 – She seemed to be an ordinary person in some ways. The author describes her as shy; and when she was receiving all the praise for *The Sea Around Us*, she described it as ridiculous. She seemed to like quiet, to go to her cottage on the Maine coast, and she certainly loved nature. In fact, that's what she wrote about. In other ways she was not an ordinary person. She was a biologist who could write really well. She had the courage to speak out and the grace to handle her critics in a thoughtful and cool manner.
- 1 – Rachel Carson was a very brave woman. When the whole society believed that pesticides were good things, she stood up and said that they were not so good as people thought. She was very smart to be able to see the things that she saw and must have had many people respect her since President Kennedy referred to her.
- 2 – Rachel Carson liked stuff like birds and sea, that's why she wrote about pesticides and chemicals and things like that. She changed people's minds about all that stuff.
- 0 – I bet she never lived in Nevada, but maybe she liked where she was from and maybe she didn't, I don't know. You know how it goes when you like this one teacher but not the class he teaches. Well, Carson was probably like that.



MATHEMATICS INTRODUCTION

Students have different abilities, needs, and interests. Yet everyone needs to be able to use mathematics in his or her personal life, in the workplace, and in further study. All students deserve an opportunity to understand the power and beauty of mathematics. Students need to learn a new set of mathematics basics that enable them to compute fluently and to solve problems creatively and resourcefully.

— **National Council of Teachers of Mathematics**
<http://www.nctm.org/standards/overview.htm>



Comprehensive mathematical knowledge is essential for success in today's world. Society needs individuals who have sound estimation skills and number and spatial sense, who are competent using and interpreting data, and who can use appropriate technology resources to solve problems and make informed decisions. These skills are essential if students are to become successful citizens, life-long learners, and competitive workers in a global marketplace.

The goals of mathematics education in Nevada include the following:

- All students will have knowledge of basic mathematical facts and relationships and the ability to perform computations.
- All students will have the ability to make sound estimations and to make sense of number relationships.
- All students will have the ability to read, interpret, and create graphs, tables, and charts.
- All students will have the ability to make geometric observations, measurements, and constructions.
- All students will have the ability to understand the effective, appropriate, and efficient use of models and mathematical tools, including calculators and computer technology.

The Nevada Mathematics Standards provide the framework for a comprehensive K-12 mathematics program and are intended to guide curriculum, instruction, and assessment, as well as other policies and practices that affect student learning. The standards serve as a foundation for teachers and curriculum specialists as they create curriculum and adopt teaching practices relevant to the needs, strengths, and diversity of Nevada's students and communities. The standards also provide clear direction for meaningful pre-service and in-service professional development. In essence, the standards help Nevada's school districts build cohesive and comprehensive systems for ensuring that all students achieve at high levels.

On the following pages are the five content strands (Standards 1.0-5.0) and four process strands (Standards 6.0-9.0) in the Nevada Mathematics Standards. The process strands are carefully integrated within the content standards to emphasize their interconnectedness. This integration is meant to emphasize the importance of teaching mathematics within the context of an application so students will not only know important skills and content but also how to use their knowledge and skills to reason and solve problems. Listed below the five content strands are the performance indicators. A check mark indicates a performance indicator is assessed in the mathematics portion of the criterion referenced tests at grade 8. The performance indicators for the process strands are also assessed; however, they are not reported separately.

Nevada Mathematics Standards and Progress Indicators

Standard 1: *Numbers, Number Sense, and Computation*

To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will accurately calculate, use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Read, write, add, subtract, multiply, and divide **real numbers** in various forms including **radicals**, exponential, and **scientific notation**.
- ✓ Compute with **rational** and **irrational numbers** to solve a variety of problems including rates, recipes, unit costs, and percents (e.g., discounts, interest, sale, prices, commissions, taxes).
 - Explain and apply number theory and the properties of real numbers to solve problems.
- ✓ Compare and order rational numbers.
- ✓ Estimate in problem-solving situations and in practical applications; determine the reasonableness of the answer and verify the results.
- ✓ Explain the relationship among fractions, decimals, and percents; translate among various representations of equal numbers (e.g., from fractions to decimals to percents, various forms of “1” such as $\frac{3}{3}$ or $\frac{16}{16}$) to solve problems efficiently.

Standard 2: *Patterns, Functions, and Algebra*

To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Use **inductive reasoning** to find the missing term in number and geometric patterns and to generalize basic patterns to the n th term, with and without calculators; use written, oral, and **symbolic language** to identify and describe patterns, **sequences**, and **functions**.
- ✓ Translate among verbal descriptions, graphic, tabular, and algebraic representations of mathematical situations.
- ✓ Identify, model, describe, and evaluate relationships, including functions, using a variety of methods with and without technology.
- ✓ Add and subtract **binomials**; describe the connection between the algebraic process and the arithmetic process.
- ✓ Describe how a change in one variable of a mathematical relationship affects the remaining variables using various tools and methods.
- ✓ Model, identify, and solve linear equations and inequalities; relate this process to the order of operations.
- ✓ Solve simple linear equations and connect that process to the order of operations.

Standard 3: Measurement

To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Demonstrate an understanding of precision, error, and **tolerance** in measurement using the appropriate measurement tool to the required degree of accuracy.
- ✓ Select and apply appropriate formulas to solve problems; identify the relationship between changes in area and volume and changes in linear measures of figures.
- ✓ Apply ratios and proportions to calculate rates and as a method of **indirect measure** (e.g., miles per hour, cost per unit).

Standard 4: Spatial Relationships and Geometry

To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will identify, represent, explain, verify, and apply spatial relationships and geometric properties.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Apply the properties of equality and proportionality to solve problems involving congruent or similar shapes.
- ✓ Use coordinate geometry and models to change scale (enlarge and reduce).
- ✓ Use coordinate geometry to represent and interpret relationships defined by equations and formulas (including distance, midpoint, and slope), with and without technology.
- ✓ Form generalizations and **validate** conclusions about properties of geometric shapes including parallel lines, perpendicular lines, bisectors, triangles, and quadrilaterals.
- ✓ Verify and explain the Pythagorean Theorem using various methods (e.g., using grid paper, applying it to a missing side of a **right triangle**); determine missing sides and angles of triangles based on properties of their sides and angles.
- Use hand tools, technology, and models to construct figures and bisect angles and line segments; distinguish among **constructions**, sketches and drawings.

Standard 5: Data Analysis

To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Organize, display, read, and analyze data, with and without technology, using a variety of displays including box and whisker plots.
- ✓ Find the **theoretical probability** of an event using different counting methods (e.g., **tree diagrams**, **sample spaces**, and organized lists) and compare those results with actual (**experimental**) results, differentiating between the probability of an event and the **odds** of an event.
- ✓ Evaluate arguments that are based on data analysis for accuracy and validity; analyze the effect a change of scale or a change of format will have on statistical charts and graphs.
- ✓ Formulate reasonable inferences and projections based on **interpolations** and **extrapolations** of data to solve problems.

Standard 6: Problem Solving

Students will develop their ability to solve problems by engaging in developmentally appropriate problem solving opportunities in which there is a need to use various approaches to investigate and understand mathematical concepts in order to: formulate their own problems; find solutions to problems from everyday situations; develop and apply strategies to solve a wide variety of problems; and integrate mathematical reasoning, communication and connections.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Select, modify, develop, and apply strategies to solve a variety of mathematical and practical problems and to investigate and understand mathematical concepts.
- ✓ Apply previous experience and knowledge to new problem-solving situations.
- ✓ Verify, interpret, and evaluate results with respect to the original problem situation, determining an efficient **strategy** for the given situation.
- Try more than one strategy when the first strategy proves to be unproductive.
- ✓ Apply multi-step, integrated, mathematical problem-solving strategies, persisting until a solution is found or until it is clear that no solution exists.
- Generalize solutions and strategies from earlier problems to new problem situations.
- ✓ Interpret and solve a variety of mathematical problems by paraphrasing, identifying necessary and extraneous information, selecting and justifying efficient methods and/or strategies, and ensuring the answer is reasonable.
- Apply combinations of proven strategies and previous knowledge to solve non-routine problems.
- Use technology, including calculators, to solve problems and verify solutions.
- Use technology, including calculators, to investigate, define, and describe quantitative relationships such as patterns and functions.

Standard 7: Mathematical Communication

Students will develop their ability to communicate mathematically by solving problems in which there is a need to obtain information from the real world through reading, listening, and observing in order to: translate this information into a mathematical language and symbols; process this information mathematically; and present results in written, oral and visual formats.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Discuss and exchange ideas about mathematics as a part of learning.
- Use inquiry techniques (e.g., discussion, questioning, research, data gathering) to solve mathematical problems.
- Read expository text to learn about mathematics.
- ✓ Interpret and solve word problems without the necessity of key words or phrases.
- ✓ Model and explain mathematical relationships using oral, written, graphical, and algebraic methods.
- Evaluate the effectiveness of written and oral presentations of mathematics.
- Make conjectures and present arguments in discussions of mathematical ideas.
- Explain and evaluate thinking about mathematical ideas and solutions based on the role of definitions, properties, common rules, and symbols in solving problems.
- Use everyday language to explain thinking about strategies and solutions to mathematical problems.
- ✓ Express mathematical ideas and use them to define, compare, and solve problems orally and in writing.
- Use mathematical notation to communicate and explain mathematical situations.

Standard 8: Mathematical Reasoning

Students will develop their ability to reason mathematically by solving problems in which there is a need to investigate significant mathematical ideas and construct their own learning in all content areas in order to justify their thinking; reinforce and extend their logical reasoning abilities; reflect on and clarify their own thinking; and ask questions to extend their thinking.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Construct, justify, and defend mathematical conclusions using logical arguments, in situations related to mathematics, science, and technology.
- ✓ Use patterns and relationships to analyze mathematical situations; draw logical conclusions about mathematical problems.
- Follow a logical argument and judge its validity.
- ✓ Recognize and apply deductive and inductive reasoning in both concrete and abstract contexts.
- Ask questions to reflect on, clarify, and extend thinking.

Standard 8: *Continued*

Grade 8 Progress Indicators

- Review and refine the assumptions and steps used to derive conclusions in mathematical arguments.
- Construct valid arguments; make and test conjectures about algebraic and geometric properties based on mathematical principles.
- ✓ Determine relevant, irrelevant, and/or sufficient information to solve mathematical problems.

Standard 9: *Mathematical Connections*

Students will develop the ability to make mathematical connections by solving problems in which there is a need to view mathematics as an integrated whole, identifying relationships between context strands, and integrating mathematics with other disciplines, allowing the flexibility to approach problems in a variety of ways within and beyond the field of mathematics.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Link new concepts to prior knowledge.
- ✓ Use mathematical ideas from one area of mathematics to explain an idea from another area of mathematics.
- ✓ Use models to explain the relationship of concepts to procedures.
- Use the connections among mathematical topics to develop multiple approaches to problems.
- Use and analyze the connections between mathematics and other disciplines.
- Apply mathematical thinking and modeling to solve problems that arise in other disciplines (e.g., rhythm in music and motion in science).
- ✓ Identify, explain, and use mathematics in everyday life.

THE NEVADA CRITERION REFERENCED TESTS

The Nevada Criterion Referenced Tests (CRT) in mathematics are designed to assess students' proficiency with respect to the 1998 Nevada K-12 Standards for Mathematics Education. A framework reference and an item specification matrix are used to guide the development of the Nevada CRT assessments. The framework and matrix are based on the commonality of the content and goals of the Nevada K-12 Standards for Mathematics Education, the National Assessment of Educational Progress (NAEP), and the National Council of Teachers of Mathematics (NCTM) Curriculum and Evaluation Standards for Mathematics. The Nevada CRT framework document is available for review on the Nevada Department of Education website at <http://www.nde.state.nv.us>.

The CRT Framework calls for assessment items in four mathematics content clusters based on the three cognitive ability domains suggested by the NAEP assessment framework (conceptual understanding, procedural knowledge, and problem-solving skills) and the priorities set forth in the Nevada K-12 Standards for Mathematics Education.

The following shows the Ability Levels (Cognitive Domains) and Content Clusters that are reported on the mathematics assessments.

Ability Levels (Cognitive Domains)

- A1 – Conceptual Understanding
- A2 – Procedures
- A3 – Problem Solving

Content Clusters

- C1 – Numbers and Operations (Standard 1)
- C2 – Algebra and Functions (Standard 2)
- C3 – Measurement and Geometry (Standards 3 & 4)*
- C4 – Data Analysis, Statistics and Probability (Standard 5)

*Approximately half of the items in Content Cluster 3 (C3) are from Standard 3 (Measurement) and the other half are from Standard 4 (Geometry).

To demonstrate conceptual understanding (A1), students should show that they are able to:

- Recognize, label, and generate examples and/or non-examples of concepts.
- Use and interrelate models, diagrams, manipulatives, and varied representations of mathematical concepts.
- Use and apply mathematical facts and definitions.
- Identify and apply principles (e.g., provide and recognize valid statements generalizing relationships among concepts in conditional form).
- Compare, contrast, and integrate related concepts and principles to the nature of the concepts and principles.
- Recognize, interpret, and apply the signs, symbols, and terms used to represent concepts.
- Interpret assumptions and relations involving concepts in mathematical settings.

To demonstrate procedural knowledge (A2), students should show that they are able to:

- Select and appropriately apply correct procedures.
- Verify or justify the correctness of a procedure using concrete models or symbolic methods.
- Extend or modify procedures to deal with factors inherent in problem settings.
- Apply numerical algorithms appropriately to specific mathematical situations or settings.
- Perform non-computational functions such as rounding and ordering.
- Describe why a particular procedure will give a correct answer for a problem in a specific context or defined situation.

To demonstrate problem-solving skills (A3), students should show that they are able to:

- Correctly apply their accumulated knowledge of Mathematics in new situations.
- Recognize and formulate problems.
- Determine the efficacy and relevance of data or information in problem-solving situations.
- Use combinations of strategies, data, models, and procedures to answer questions.
- Use reasoning in new settings.
- Judge the reasonableness and correctness of solutions.

The matrix that follows explains the configuration of the mathematics examination at grade 8.

CRT Grade 8 Mathematics Examination Item Matrix						
Content Cluster/ Ability Level (Cognitive Domain)	C1 Numbers and Operations (Standard 1)	C2 Algebra and Functions (Standard 2)	C3 Measurement and Geometry (Standards 3&4)*	C4 Data Analysis: Statistics & Probability (Standard 5)	Total Items	Percent
A1 Conceptual Understanding	5	4	5	4	18	40
A2 Procedures	4	2	3	2	11	24
A3 Problem Solving	4**	3	5	4**	16	36
Total Items	13	9	13	10	45	
Percent	29	20	29	22		100

* Approximately half of the items in content Cluster 3 (C3) are from Standard 3 (Measurement) and the other half are from Standard 4 (Geometry).

** Indicates a constructed-response item.

Constructed-Response Items

Constructed-response items present students with a question or questions that require students to respond in written form. Typically items ask students to not only recall knowledge, but also demonstrate more complex cognitive behaviors such as organizing, summarizing, comparing, relating, analyzing, inferring, concluding, predicting, solving, and/or applying. A constructed-response item can appear in several different formats and reflect either the A2 or A3 Ability Level. An item may be specific in its request or more open-ended.

Constructed-responses will have a set, which scaffolds the student's thinking, and directions for the task.

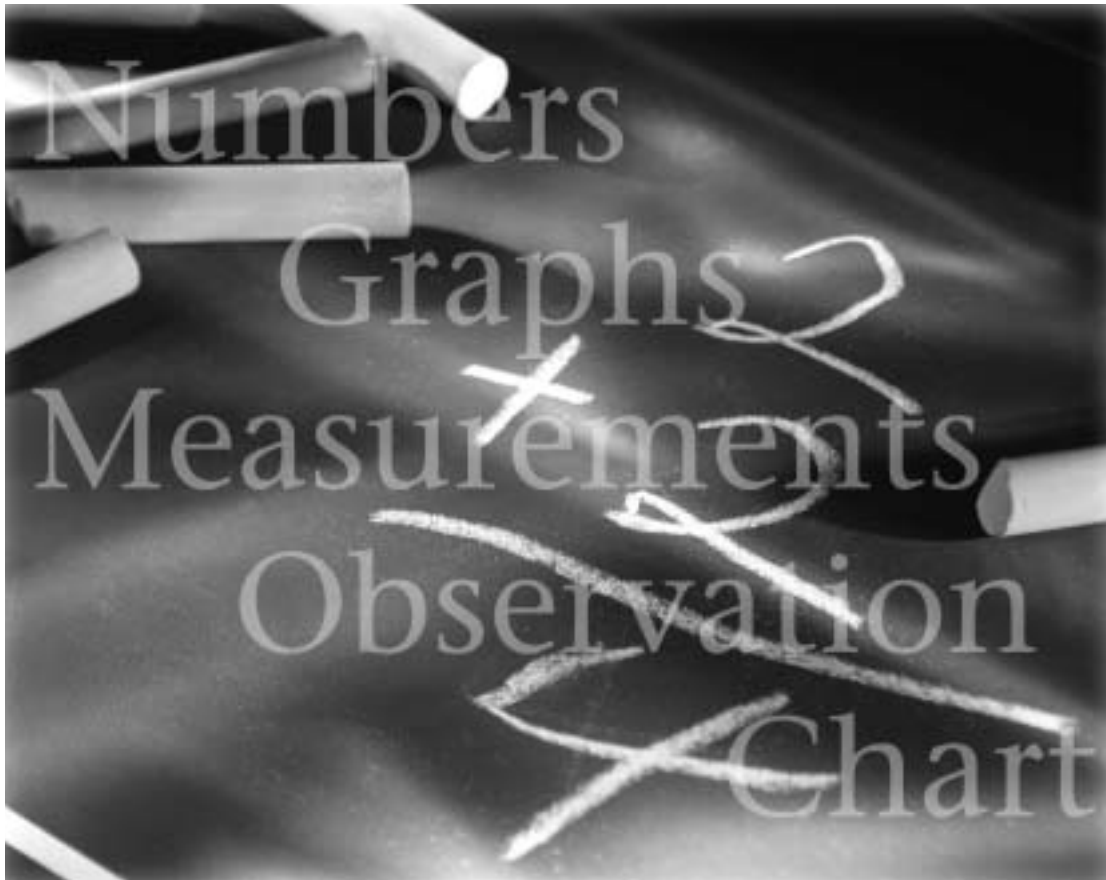
Students receive a score of 0-3 points on their answer, with 0 being the lowest and 3 being the highest. A score of 2 or 3 is deemed proficient. A student's score depends on how closely his

or her answer matches the description in the item-specific rubric and the anchor papers for each constructed-response item.

For each constructed-response item, an item-specific rubric is designed based on the general rubric. (See below for example.) Anchor papers, which are exemplary responses of typical student responses at each score point, are selected to guide the trained readers who score students' responses.

Constructed-Response Scoring Rubric

Score Point	Expectation
3	<p>The response completely answers all parts of the question and displays thorough understanding of the skill(s) within the standard being tested. The response provides an answer that:</p> <ul style="list-style-type: none"> • clearly and correctly indicates the mathematical ideas and processes applied and provides evidence of the problem-solving techniques and/or thinking skills used to solve the problem. • clearly and correctly labels all answers, if required.
2	<p>The response partially, but adequately, answers the question and displays satisfactory understanding of the skill(s) being tested. The response provides an answer that:</p> <ul style="list-style-type: none"> • correctly completes all parts of the task but contains minor flaws in the reasoning or a minor notational error in recording a solution to a part of the problem. • completes the entire task but uses incomplete, or disorganized information to represent the solution process and/or a problem solution.
1	<p>The response demonstrates a limited understanding of the skill(s) being tested. The response provides an answer that:</p> <ul style="list-style-type: none"> • correctly solves the problem but does not provide clearly acceptable answers for the entire problem. • provides an acceptable response for one part of the question, but fails to attempt a solution for the other part(s) of the problem
0	<p>The response demonstrates a lack of understanding of the skill(s) being tested. The response provides an answer that:</p> <ul style="list-style-type: none"> • does not answer the question clearly enough to demonstrate any understanding. • provides incorrect or inappropriate responses to the question.



GRADE 8 MATHEMATICS

Reporting Category: C1 – Numbers and Operations
Ability Level: A1 – Conceptual Understanding
Performance Indicator: Read, write, add, subtract, multiply, and divide real numbers in various forms including radicals, exponential, and scientific notation.

Test Item:

The state of Missouri contains close to 6.5×10^4 acres of prairie land. What is 6.5×10^4 in standard notation?

- A 650,000
- B 65,000
- C 6,500
- D 650

Correct Response B: The student should recognize changing a number from scientific notation to standard notation means to multiply a number by a power of 10 as shown below.

$$\begin{aligned} &6.5 \times 10^4 \\ &6.5 \times 10,000 \text{ (} 10^4 = 10,000 \text{)} \\ &65,000 \end{aligned}$$

Response A: This response is incorrect. It represents an error in which the student may have left off the decimal in 6.5 and used 65 when multiplying by 10,000.

Response C: This response is incorrect. It represents an error in which the student may not have moved the decimal point enough spaces after multiplying 6.5 by 10,000.

Response D: This response is incorrect. It represents an error in which the student may have multiplied 6.5 by 10 instead of 10,000.

GRADE 8 MATHEMATICS

Reporting Category: C1 – Numbers and Operations

Ability Level: A2 – Procedural Skills

Performance Indicator: Estimate in problem-solving situations and in practical applications; determine the reasonableness of the answer and verify the results.

Test Item:

One thousand people were surveyed and asked which one amusement park ride out of a list of six was their most favorite ride. The table shows the results.

Most Favorite Ride

Ride	Number of People
Bumper Cars	142
Ferris Wheel	117
Free-Fall	213
Merry-Go-Round	93
Roller Coaster	248
Water Ride	187

Which percent is closest to the number of people in the survey who chose the Roller Coaster as their most favorite ride?

- A 10%
- B 25%
- C 30%
- D 35%

Correct Response B:

The student should recognize that the percent of people in the survey who chose the Roller Coaster could be found by using a proportion.

$$\begin{aligned}\frac{\text{Part}}{\text{Whole}} &= \frac{\text{People who chose the Roller Coaster}}{\text{Total Number of People in the Survey}} \\ \frac{n}{100} &= \frac{248}{1000} \\ n &= \frac{248 \cdot 100}{1000} \\ n &= \frac{24800}{1000} = 24.8 \\ n &= 24.8\end{aligned}$$

Therefore, the answer is 25% because it is closest to 24.8%.

GRADE 8 MATHEMATICS

- Response A:** This response is incorrect. The student may have accidentally misread the table and used the number of people who chose the Merry-Go-Round as their favorite ride instead of the Roller Coaster.
- Response C:** This response is incorrect. The student may have rounded 248 to 300 and proceeded to find the percent of people who chose the Roller Coaster as their most favorite ride. The problem with rounding 248 to 300 is that 248 is closer to 250 than 300.
- Response D:** This response is incorrect. The student may have compared the number of people who chose the Roller Coaster as their most favorite ride to all the people who did not.

GRADE 8 MATHEMATICS

Reporting Category:	C1 – Numbers and Operations
Ability Level:	A3 – Problem Solving
Performance Indicator:	Compute with rational and irrational numbers to solve a variety of problems including rates, recipes, unit costs, and percents (e.g., discounts, interest, sale, prices, commissions, and taxes.)

Test Item:

Jackie has a part-time job selling magazine orders. The price for each magazine order is \$40.00, which includes shipping and handling. There is an additional 8% sales tax charged on each magazine order. If each magazine order includes 12 issues, what is the price per magazine issue, including tax?

- A \$4.00
- B \$3.60
- C \$3.33
- D \$3.20

Correct Response B:	<p>The student should be able to recognize that division is involved in finding the price per issue. The total price of each magazine order should include sales tax before finding the price of each issue.</p> <p>Step 1: Find the sales tax on one magazine order by multiplying \$40.00 by 8%. Change the percent to decimal form.</p> $\$40.00 \times 0.08 = \3.20 <p>Step 2: Add the sales tax to one magazine order.</p> $\$40.00 + \$3.20 = \$43.20$ <p>Step 3: Divide the total price of one magazine order, which includes the sales tax, by 12.</p> $\$43.20 \div 12 = \3.60
Response A:	<p>This response is incorrect. The student may have added the price of one magazine order and sales tax then divided by the number of issues (e.g., $(40 + 8) \div 12$).</p>
Response C:	<p>This response is incorrect. The student may have forgotten to include the sales tax charge and simply divided the price of each magazine order by the number of issues.</p>
Response D:	<p>This response is incorrect. The student may have solved for the sales tax on one magazine order and confused it for the price of each issue.</p>

GRADE 8 MATHEMATICS

Reporting Category:	C2 – Algebra and Functions
Ability Level:	A1 – Conceptual Understanding
Performance Indicator:	Use inductive reasoning to find the missing term in number and geometric patterns and to generalize basic patterns to the n th term, with and without calculators; use written, oral, and symbolic language to identify and describe patterns, sequence, and functions.

Test Item:

Matt was asked to construct a pattern based on the following rule.

Begin with a whole number and create a sequence by adding the same constant to each successive term to find the next term.

Which of these patterns follows the rule Matt used to construct his pattern?

- A 1, 2, 4, 6, 10, ...
- B 1, 1, 2, 3, 5, ...
- C 0, 3, 6, 9, 12, ...
- D 0, 1, 3, 5, 7, ...

Correct Response C:	The student should be able to recognize that 3 is added to the first term and each successive term.
Response A:	This response is incorrect. The student may have recognized that the same constant is added to the second and third terms but may have not noticed that a different constant is added to the first and fourth terms.
Response B:	This response is incorrect. The student may have recognized that the same constant is added to the second and third terms but may have not noticed that a different constant is added to the first and fourth terms.
Response D:	This response is incorrect. The student may have recognized that the same constant is added to the second, third, and fourth terms but may have not noticed that a different constant is added to the first term.

GRADE 8 MATHEMATICS

Reporting Category: C2 – Algebra and Functions

Ability Level: A2 – Problem Solving

Performance Indicator: Identify, model, describe, and evaluate relationships, including functions, using a variety of methods with and without technology.

Test Item:

Doug was playing a video game in which the player must complete an increasing number of stages. The table shows the number of stages that have to be completed in each of the first five levels of the game.

Level	Number of Stages
1	1
2	3
3	5
4	7
5	9
6	?

Based on the number pattern in the table, which of these could be used to find the number of stages that have to be completed in the sixth level of the game, with x representing the level of the game?

- A $(2 - x)^2$
- B $x^2 - 1$
- C $1 - 2x$
- D $2x - 1$

GRADE 8 MATHEMATICS

- Correct Response D:** The student should be able to recognize that the number of stages is one less than twice the level number starting with level 2, then recognize that the same holds true for level 1.
- Response A:** This response is incorrect. This equation only works for levels 1 and 5.
- Response B:** This response is incorrect. This equation only works for level 2.
- Response C:** This response is incorrect. This equation gives the number of stages as negative integers.

GRADE 8 MATHEMATICS

Reporting Category: C2 – Algebra and Functions
Ability Level: A3 – Problem Solving
Performance Indicator: Model, identify, and solve linear equations and inequalities; relate this process to the order of operations.

Test Item:

**Write your answer to Question # on Page # in your Answer Booklet.
Be sure to answer Parts A, B, and C.**

Mr. Benavides gave his students two options on how to earn points on a class activity to review for a test. The options are shown below.

Option 1: 5 points for each correct answer

Option 2: 10 points for participating and 3 points for each correct answer

- A** For each option, determine the number of points each student could earn if 15 questions were answered correctly? Show or explain how you got your answer.
- B** If c represents the number of questions correctly answered and p represents the total number of points a student could earn, write an equation that could represent each option.
- C** How many questions would have to be answered correctly in order for a student who chose option 1 and a student who chose option 2 to earn the same number of points? Show or explain how you got your answer.

Complete and Correct Response (similar to the following):

Part A: 75 points for option 1
55 points for option 2

Work: For option 1, each correct answer is worth 5 points. Therefore,
 $15 \text{ correct answers} \times 5 \text{ points} = 75 \text{ points}.$

For option 2, a student automatically receives 10 points for participating and each correct answer is worth 3 points. Therefore,
 $10 \text{ points} + (15 \text{ correct answers} \times 3 \text{ points}) = 10 \text{ points} + 45 \text{ points} = 55 \text{ points}.$

Part B: $p = 5c$ for option 1
 $p = 10 + 3c$ for option 2

Part C: 5 correct answers

Work: To find out how many questions would have to be answered correctly for a student who chose option 1 and a student who chose option 2, the equations in Part B would have to be equal to each other.

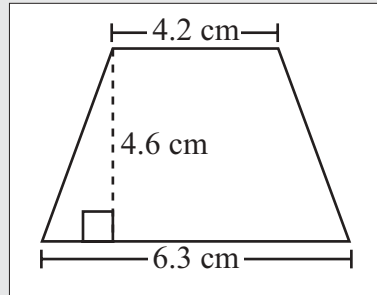
$$\begin{aligned}5c &= 10 + 3c \\5c - 3c &= 10 + 3c - 3c \\2c &= 10 \\c &= 5\end{aligned}$$

GRADE 8 MATHEMATICS

Score Point	Description
3	Student gives correct answer to Parts A, B, and C showing appropriate work.
2	Student gives correct answer to any two parts and shows appropriate work. OR Student gives correct answer to all parts but does not show any appropriate work. (Student shows understanding of the problem, but makes minor computational errors.)
1	Student gives correct answer to Part A and B only and shows appropriate work for that part. (Student demonstrates minimal understanding of the problem.)
0	Student's response is totally incorrect or irrelevant.

GRADE 8 MATHEMATICS

Reporting Category: C3 – Measurement and Geometry
Ability Level: A1 – Conceptual Understanding
Performance Indicator: Select and apply appropriate formulas to solve problems.
Test Item:



Which expression could be used to find the area, in square centimeters?

- A $(4.2 + 6.3)(4.6)$
- B $(4.2)(6.3)(4.6)$
- C $\frac{(4.2 + 6.3)}{4.6}$
- D $\frac{(4.2 + 6.3)(4.6)}{2}$

Correct Response D: The student should use the formula for the area of a trapezoid. The formula to use for area of a trapezoid is:

$$A = \frac{1}{2} (b_1 + b_2)(h)$$

Let $b_1 = 4.2$, $b_2 = 6.3$ and $h = 4.6$. Therefore by substitution,

$$\frac{1}{2} (4.2 + 6.3)(4.6)$$

Response A: This response is incorrect. It represents an error in which the student may have not remembered to find the average of the bases before multiplying by the height.

Response B: This response is incorrect. It represents an error in which the student may have used the formula lwh because there are 3 measurements labeled on the trapezoid.

Response C: This response is incorrect. The student may have thought that the formula for the area of the trapezoid involved division and incorrectly divided by the height.

GRADE 8 MATHEMATICS

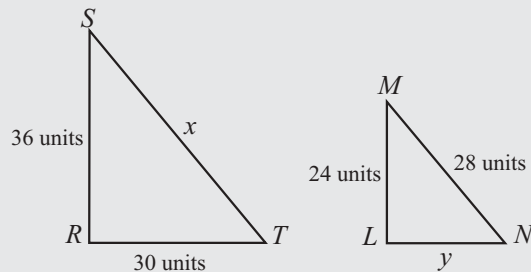
Reporting Category: C3 – Measurement and Geometry

Ability Level: A2 – Procedural Skills

Performance Indicator: Apply the properties of equality and proportionality to solve problems involving congruent or similar shapes.

Test Item:

In the diagram below, $\triangle RST$ is similar to $\triangle LMN$.



What is the length of \overline{ST} ?

- A 42 units
- B 35 units
- C 28 units
- D 20 units

Correct Response A: The student should recognize that if $\triangle RST$ is similar to $\triangle LMN$, then \overline{ST} corresponds to \overline{MN} . The length of \overline{ST} could be found by using a proportion.

$$\frac{\text{the length of } \overline{ST}}{\text{the length of } \overline{SR}} = \frac{\text{the length of } \overline{MN}}{\text{the length of } \overline{ML}}$$

$$\frac{x}{36 \text{ units}} = \frac{28 \text{ units}}{24 \text{ units}}$$

$$x = \frac{28 \text{ units} \cdot 36 \text{ units}}{24 \text{ units}}$$

$$x = \frac{1008 \text{ units}}{24}$$

$$x = 42 \text{ units}$$

Therefore the length of \overline{ST} is 42 units.

Response B: This response is incorrect. It represents an error in which the student may have used the length of side \overline{RT} for the length of \overline{RS} .

Response C: This response is incorrect. It represents an error in which the student may have assumed the length of side \overline{ST} was equal to its corresponding side \overline{MN} .

Response D: This response is incorrect. It represents an error in which the student may have solved for the length of side \overline{LN} .

GRADE 8 MATHEMATICS

Reporting Category:	C3 – Measurement and Geometry
Ability Level:	A3 – Problem Solving
Performance Indicator:	Estimate and convert units of measure for mass and volume within the same measurement system; compare corresponding units of the two systems.

Test Item:

Linda is planning to make 3 gallons of fruit punch to serve at her club meeting. How many 12-ounce servings of punch can she serve with 3 gallons?
(1 gallon = 128 ounces)

- A 36
- B 32
- C 15
- D 10

Correct Response B: The student should recognize that this problem involves finding the number of ounces equivalent to 3 gallons and the number of 12-ounce servings in 3 gallons of punch. This problem could be solved using proportions.

Step 1:

Let x represent the number of ounces in 3 gallons.

$$\frac{x}{3 \text{ gallons}} = \frac{128 \text{ ounces}}{1 \text{ gallon}}$$

$$x = \frac{(128 \text{ ounces})(3 \text{ gallons})}{1 \text{ gallon}}$$

$$x = 384 \text{ ounces}$$

Step 2:

Let y represent the number of servings in 3 gallons.

$$\frac{y}{384 \text{ ounces}} = \frac{1 \text{ serving}}{12 \text{ ounces}}$$

$$y = \frac{(1 \text{ serving})(384 \text{ ounces})}{12 \text{ ounces}}$$

$$y = 32 \text{ servings}$$

Response A: This response is incorrect. The student may have found the product of the number of gallons and then number of ounces in 1 serving, (i.e., 3×12).

Response C: This response is incorrect. The student may have found the sum of the number of gallons and the number of ounces in 1 serving, (i.e., $3 + 12$).

Response D: This response is incorrect. The student may have found the quotient of the number of ounces in one gallon and the number of ounces in 1 serving, (i.e., $128 \div 12$).

GRADE 8 MATHEMATICS

Reporting Category:	C4 – Data Analysis: Statistics and Probability
Ability Level:	A1 – Conceptual Understanding
Performance Indicator:	Organize, display, read, and analyze data, with and without technology, using a variety of displays including frequency distributions and circle graphs.
Test Item:	

The stem-and-leaf plot below shows the number of requests for songs to be played each hour during a 16-hour segment.

Number of Calls Received each Hour

0	7 9
1	0 3 7 8
2	1 3 3 5 9
3	2 5 5 5
4	7

Key
4 3 represents 43

What is the range of the number of calls per hour?

- A 47
- B 40
- C 35
- D 23

Correct Response B:	The student should know that the range of a set of data is the difference between the largest and smallest number in a set of data. The largest number in the data is 47 and the smallest number is 7. Therefore, $47 - 7 = 40$.
Response A:	This response is incorrect. The student may have confused the largest number for the range.
Response C:	This response is incorrect. The student may have confused the mode for the range.
Response D:	This response is incorrect. The student may have confused the median for the range.

GRADE 8 MATHEMATICS

Reporting Category:	C4 – Data Analysis: Statistics and Probability
Ability Level:	A2 – Procedural Skills
Performance Indicator:	Find the number of combinations possible in given situations using a variety of counting methods.

Test Item:

Mr. Larson is having a family portrait done by Donavon's Portrait Studios. He could choose from five different backgrounds, three different portrait sizes, and four different poses. How many different combinations of one background, one portrait size, and one pose could he choose?

- A 60
- B 35
- C 19
- D 12

Correct Response A: The student should recognize that the fundamental counting principle could be applied here. The principle states that all possible outcomes in a situation can be found by multiplying the number of ways each event can occur.

$5 \text{ backgrounds} \times 3 \text{ portrait sizes} \times 4 \text{ poses} = 60 \text{ different combinations}$

Response B: This response is incorrect. The student may have added the number of different backgrounds to the product of the number of different portrait sizes and poses (e.g., $5 + 3 \times 4 = 35$).

Response C: This response is incorrect. The student may have added the product of the number of different backgrounds and portrait sizes by the different poses (e.g., $5 \times 3 + 4 = 19$).

Response D: This response is incorrect. The student may have added all three possible choices, number of different backgrounds, portrait sizes, and poses (e.g., $5 + 3 + 4 = 12$).

GRADE 8 MATHEMATICS

Reporting Category:	C4 – Data Analysis: Statistics and Probability
Ability Level:	A3 – Procedural Skills
Performance Indicator:	Find the theoretical probability of an event using different counting methods (e.g., tree diagrams, sample spaces, and organized lists) and compare those results with actual (experimental) results, differentiating between the probability of an event and the odds of an event.

Test Item:

Olivia has a bag that contains different flavored pieces of candy. The bag contains the following amounts of different flavors: 4 strawberry, 2 lemon, 3 apple, and 1 orange. If Olivia takes one candy from this bag at random, what are the odds that it will be a lemon-flavored candy?

- A 4 to 5
- B 3 to 4
- C 1 to 4
- D 1 to 5

Correct Response C: The student should recognize that the odds in favor of an event taking place is the ratio shown below:

$$\frac{\text{number of favorable outcomes}}{\text{number of unfavorable outcomes}}$$

The favorable outcome in Olivia's situation would be the 2 lemon-flavored pieces of candy. Her unfavorable outcome would be 10 pieces of candy minus the 2 lemon-flavored ones, which would be 8 different pieces of candy that are not lemon-flavored.

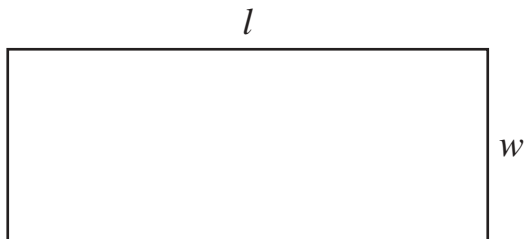
Therefore,

$$\frac{\text{number of lemon-flavored pieces of candy}}{\text{number of pieces of candy not lemon-flavored}} = \frac{2}{10 - 2} = \frac{2}{8} = \frac{1}{4} \text{ or 1 to 4.}$$

Response A:	This response is incorrect. This is the probability of Olivia randomly not taking out a lemon-flavored piece of candy.
Response B:	This response is incorrect. This is the odds against Olivia randomly not taking out a lemon-flavored piece of candy.
Response D:	This response is incorrect. This is the probability of Olivia randomly not taking out a lemon-flavored piece of candy.

MATHEMATICS SAMPLE TEST

- 1** Charlene helps to construct stages for concerts. She needs to increase the size of the stage shown below.



Charlene plans to create a new stage by doubling l , the length, and doubling w , the width, of the original stage. Which of these could represent the area of the new stage?

- A lw
B $2lw$
C $4lw$
D $8lw$
- 2** An 8-inch by 10-inch photograph is reduced by a scale of $\frac{3}{5}$.

What is the length of the shortest side of the reduced photograph?

- A 3.2 in
B 4.8 in
C 5.0 in
D 6.0 in

- 3** If 16% of the 150 eighth graders who attend Middletown Middle School went on a field trip to the local planetarium, which fraction is equivalent to the number of students who went on the field trip?

- A $\frac{1}{4}$
B $\frac{8}{75}$
C $\frac{1}{16}$
D $\frac{4}{25}$

- 4** Ben and Sue both left Martha's house at the same time. Ben drove 60 miles due east to get home. Sue drove 80 miles due west to get home. How much farther away from Martha's house is Sue than Ben?

- A 20 miles
B 60 miles
C 80 miles
D 140 miles

MATHEMATICS SAMPLE TEST

- 5** Peter was looking at his paycheck and noticed that 28% of his weekly salary is taken out for taxes and other deductions. This means he only gets to keep 72% of his weekly income. In the equation below, I represents Peter's weekly income and s represents his weekly salary.

$$I = 0.72s$$

What would happen to Peter's weekly income, I , if his weekly salary, s , increased by 10%?

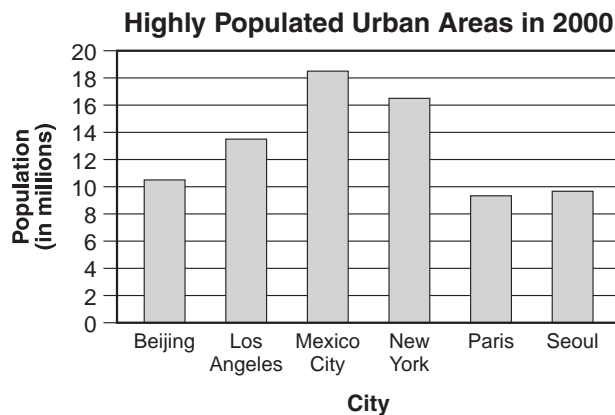
- A It would increase by 10%.
- B It would increase by 18%.
- C It would increase by 20%.
- D It would increase by 28%.

- 6** Which of the following best represents the sentence below?

If a number is multiplied by 2 and then 6 is subtracted from the product, the result is 20.

- A $2 \cdot 6 - n = 20$
- B $n - 2 \cdot 6 = 20$
- C $6n - 2 = 20$
- D $2n - 6 = 20$

- 7** The graph below shows the populations for 6 large cities.



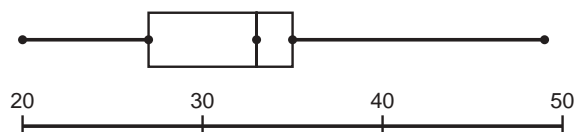
Based on the graph, which of the following is a true statement?

- A New York City's population is close to 6 million greater than Beijing's population.
- B The sum of the populations of Paris and Seoul are less than the population of Los Angeles.
- C The difference in population between Paris and Beijing is less than 1 million.
- D Mexico City's population is close to 45% greater than the population of Los Angeles.

MATHEMATICS SAMPLE TEST

- 8** The box-and-whiskers plot below shows the data from the scores for the winning teams in the ten Super Bowls from 1994 through 2003.

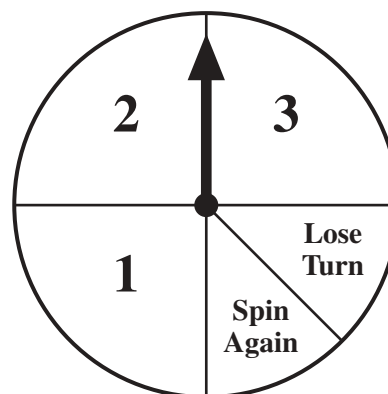
Winning Teams' Scores in the Super Bowl from 1994 to 2003



Based on the graph, which of these is closest to the median of the data?

- A 37
- B 33
- C 27
- D 20

- 9** Noah and Dave played a board game that used the spinner shown below. The “Lose Turn” and “Spin Again” sections are each one-half the size of one of the numbered sections.



On his turn, Dave spun the arrow on the spinner one time. Which of these is a true statement about the outcome of his spin?

- A An outcome of “1” or “2” is equally likely.
- B An outcome of “Spin Again” is not possible.
- C An outcome of “3” is more likely than an outcome of “1”.
- D An outcome of “2” is less likely than an outcome of “Lose Turn”.

MATHEMATICS SAMPLE TEST

- 10** During tennis practice, each of the 6 girls on the team played one game with each of the other girls. In all, how many games were played?

A 6
B 12
C 15
D 36

- 11** Brad solved the inequality below.

$$2x + 7 < -13$$

What value of x makes the inequality true?

A $x < 10$
B $x < 3$
C $x < -3$
D $x < -10$

- 12** On Monday, four friends went to their favorite bookstore and each one purchased the same 1019-page book. At the end of the week, each friend told one another the best estimate of how much of the book each had read.

Amount of Book Read

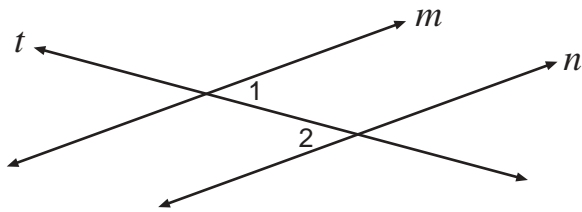
Friend	Fraction Read
Brent	$\frac{10}{12}$
Latoya	$\frac{6}{13}$
Vanessa	$\frac{4}{11}$
Zeke	$\frac{7}{9}$

According to the table above, which friend had read the least amount of pages?

A Brent
B Latoya
C Vanessa
D Zeke

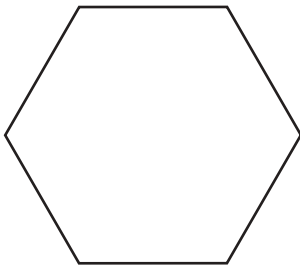
MATHEMATICS SAMPLE TEST

- 13** In the diagram below, lines m and n are intersected by line t and form the numbered angles.



To prove that lines m and n are parallel, what must the measure of $\angle 2$ be if $\angle 1$ measures 55 degrees?

- A 35 degrees
 - B 55 degrees
 - C 125 degrees
 - D 145 degrees
- 14** Pictured below is a regular hexagon.



What is the sum of the interior angles of the regular hexagon?

- A 180°
- B 360°
- C 720°
- D 1080°

- 15** Which of the following expressions represents the difference of the polynomials $(3x + 1)$ and $(x + 9)$?

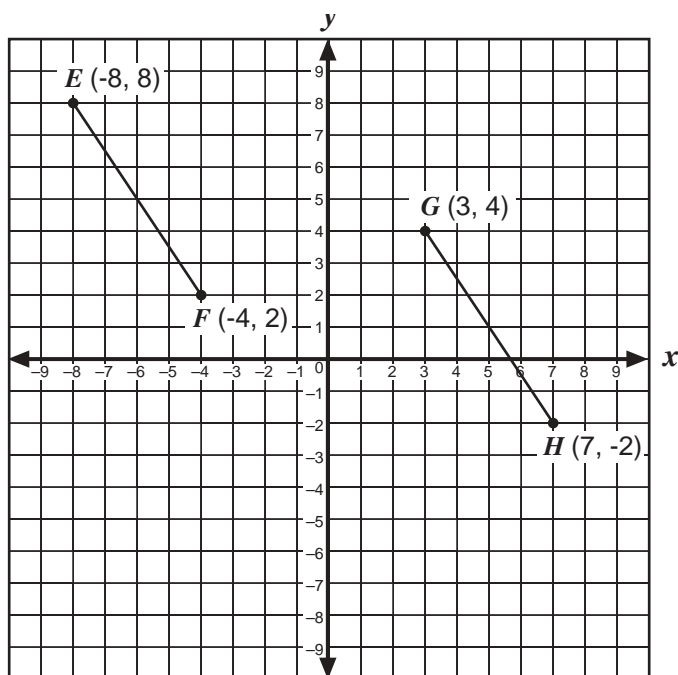
- A $4x - 8$
- B $2x + 8$
- C $2x - 8$
- D $5x$

MATHEMATICS SAMPLE TEST

Write your answer to Question 16 in your Answer Booklet. Be sure to answer Parts A, B, and C.

16

A band director sketched line segments \overline{EF} and \overline{GH} as shown on the graph below. The line segments represent the path two different groups of band members will follow during part of their halftime routine.



- A Find the distance of line segments \overline{EF} and \overline{GH} . The distance formula is

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Show or explain how you got your answer.

- B Find the distance of line segments \overline{EF} and \overline{GH} . The distance formula is

$$\frac{(y_2 - y_1)}{(x_2 - x_1)}$$

Show or explain how you got your answer.

- C According to your answers in part A and B, are the paths represented by line segments \overline{EF} and \overline{GH} equal in length and parallel? Explain how you got your answer.

MATHEMATICS SAMPLE TEST ANSWER KEY

Item Number	Reporting Category	Ability Level	Answer Key
1	C3	A3	C
2	C3	A2	B
3	C1	A2	D
4	C1	A3	A
5	C2	A3	B
6	C2	A1	D
7	C4	A2	A
8	C4	A1	B
9	C4	A2	A
10	C4	A3	C
11	C2	A2	D
12	C1	A1	C
13	C3	A1	B
14	C3	A2	C
15	C2	A2	B
16	C3	A3	*

* Indicates a constructed-response item. See the following page for the rubric and sample response.

MATHEMATICS SAMPLE TEST ANSWER KEY

Rubric for Item 16

Score Point	Description
3	Student gives correct answer to Parts A, B, and C, showing appropriate work.
2	Student gives correct answer to any two parts and shows appropriate work. OR Student gives correct answer to all parts but does not show any appropriate work. (Student shows understanding of the problem, but makes minor computational errors.)
1	Student gives correct answer to Part A and B only and shows appropriate work for that part. (Student demonstrates minimal understanding of the problem.)
0	Student's response is totally incorrect or irrelevant.

Complete and Correct Response for Question 16 (similar to the following):

Part A: Line segment \overline{EF} is $\sqrt{52}$ units or close to 7.2 units in length.
Line segment \overline{GH} is $\sqrt{52}$ units or close to 7.2 units in length.

Work: To find the slope of each line segment, use the distance formula and substitute the ordered pairs in their designated places.

$$m_{EF} = \sqrt{(-4 - (-8))^2 + (2 - 8)^2} = \sqrt{4^2 + (-6)^2} = \sqrt{16 + 36} = \sqrt{52} \approx 7.2$$

$$m_{GH} = \sqrt{(7 - 3)^2 + (-2 - 4)^2} = \sqrt{4^2 + (-6)^2} = \sqrt{16 + 36} = \sqrt{52} \approx 7.2$$

Part B: The slope of line segment \overline{EF} is $-\frac{6}{4}$ or $-\frac{3}{2}$

The slope of line segment \overline{GH} is $-\frac{6}{4}$ or $-\frac{3}{2}$

Work: To find the slope of each line segment, use the slope formula and substitute the ordered pairs in their designated places.

$$\text{Slope of line segment } \overline{EF} = \frac{8-2}{-8-(-4)} = \frac{8-2}{-8+4} = -\frac{6}{4} = -\frac{3}{2}$$

$$\text{Slope of line segment } \overline{GH} = \frac{8-2}{-8-(-4)} = \frac{8-2}{-8+4} = -\frac{6}{4} = -\frac{3}{2}$$

MATHEMATICS SAMPLE TEST

Part C:

Line segments \overline{EF} and \overline{GH} are equal in distance and parallel.

Explanation:

Both line segments are equal in distance as shown in part A and parallel because their slopes are the same as shown in part B.

SCIENCE INTRODUCTION




SCIENCE INTRODUCTION

The National Science Education Standards define science literacy in a very broad sense.

Scientific literacy is the knowledge and understanding of scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity. It also includes specific types of abilities. Scientific literacy means that a person can ask, find, or determine answers to questions derived from curiosity about everyday experiences. It means that a person has the ability to describe, explain, and predict natural phenomena. Scientific literacy entails being able to read with understanding articles about science in the popular press and to engage in social conversation about the validity of the conclusions. Scientific literacy implies that a person can identify scientific issues underlying national and local decisions and express positions that are scientifically and technologically informed. A literate citizen should be able to evaluate the quality of scientific information on the basis of its source and the methods used to generate it. Scientific literacy also implies the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately. Individuals display their scientific literacy in different ways, such as appropriately using technical terms, or applying scientific concepts and processes. And individuals often will have differences in literacy in different domains, such as more understanding of life-science concepts and words, and less understanding of physical-science concepts and words. Scientific literacy has different degrees and forms; it expands and deepens over a lifetime, not just during the years in school. But the attitudes and values established toward science in the early years will shape a person's development of scientific literacy as an adult.

– (NSES, <http://www.nap.edu/html/nses/html/2.html#perspectives>).



The goals of science assessments in Nevada are at least threefold. First, they will provide a measure of student achievement relative to the intended learning outcomes. Assessment and learning are closely related, so as the intended outcomes are defined for assessment, teachers and students will redefine their expectations to meet the outcomes. Second, they should provide an operational definition of important curricula, and a mechanism for communicating the expectations of the standards to everyone concerned. Third, there should be a feedback mechanism in the state's science education system that can lead to changes by stimulating adjustments in policy, guiding professional development, promoting changes in instructional practices, and encouraging students to improve their understanding of science.

Nevada's Content and Performance Standards in Science define the breadth and depth of science that all our students will come to understand. The intended learning outcomes of science education within the science standards are rich and varied. These outcomes include:

- Knowing and understanding scientific facts, concepts, principles, laws, and theories.
- The ability to inquire and to design and perform scientific investigations.
- The ability to reason scientifically.
- The ability to communicate effectively about science.
- The ability to use science to make personal decisions and to take positions on appropriate issues.

The Nevada Science Content Standards consist of 24 individual standards that are clustered into four categorical strands for reporting purposes on the Grade 8 Science Assessment:

- C1 – Physical Science (Standards 1 through 5)
- C2 – Life Science (Standards 6 through 9, including standards 15.1 and 15.2)
- C3 – Earth/Space/Environmental Science (Standards 11 through 17, including standard 15.3)
- C4 – Science Skills, Processes, and Investigations (Standards 18 through 24)

In the following tables are the standards and progress indicators tested at grade 8. The progress indicators that are check-marked are priority standards.

Nevada Science Standards and Progress Indicators	
Standard 1: <i>Forces and Motion</i> Students understand that forces such as gravitational, electrical, and magnetic influence the motion of objects.	
Grade 8 Progress Indicators	
By the end of Grade 8, students know and are able to do everything required in the previous grades and:	
✓	Investigate and describe that multiple forces acting on an object along a straight line affect the motion of an object.
✓	Describe the force (gravity) which makes objects fall and planets move in their orbits.
✓	Investigate and describe that certain physical principles are used in the design and function of simple machines.
✓	Investigate and describe that buoyancy changes the apparent weight of an object immersed in a fluid.
✓	Investigate and explain that electric current produces magnetic forces, and moving magnets produce electric forces in conductors .

Standard 2: <i>Structure and Properties of Matter</i> Students understand that materials have distinct properties which depend on the amount of matter present, its chemical composition, and structure.	
Grade 8 Progress Indicators	
By the end of Grade 8, students know and are able to do everything required in the previous grades and:	
✓	Use simple models to explain observed properties of matter (e.g., use a particle model to account for the states of matter).
✓	Separate substances based on their physical and chemical properties (e.g., color, solubility, chemical reactivity , melting point, boiling point).
✓	Use models or drawings to explain how atoms may join together to form molecules or large groups of molecules.
✓	Explain that all atoms are made up of protons, neutrons, and electrons.
✓	Explain that liquids, solids, and gases are systems of particles.
✓	Explain that various elements combine in a multitude of ways to produce all known living and non-living substances.

Standard 3: *Energy and Matter – Interactions and Forms*

Students understand that changes in temperature and pressure can alter states of matter. Energy exists in many forms, and one form can change into another.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Investigate and describe how heat moves from one object to another at different rates, depending on what the objects are made of and whether they are touching each other.
- ✓ Investigate and describe how all phase changes are accompanied by changes in energy.
- ✓ Investigate and describe how waves transfer energy and move at different speeds in different materials.
- ✓ Investigate, create, and describe parallel, series, and combination circuits.
- ✓ Investigate and describe how energy may be transferred into or out of a system or object in many ways and readily changes forms.
- ✓ Identify the energy involved in a particular process as potential (energy of position and stored chemical energy) or kinetic (energy of motion).

Standard 4: *Chemical Reaction*

Students understand that chemical reactions change substances into different substances.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Investigate and describe how in **chemical reactions**, the total mass is conserved and the elements involved do not change into other elements.
- ✓ Investigate and describe how the rate of a chemical reaction can be influenced by variables such as temperature, **pH**, and light.
- ✓ Investigate and describe how materials may give off heat or light when they react chemically with each other.
- ✓ Predict common properties of elements using the Periodic Table.

Standard 5: *Nuclear Energy and Electromagnetic Energy*

Students understand that nuclear energy and electromagnetic energy are produced from both natural and human-made sources in many forms.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Investigate and describe how light interacts with matter by moving through the matter, being absorbed by matter, or being scattered by the matter.
- Describe some applications of **radioactive isotopes** including using nuclear energy to produce heat.
- ✓ Compare and contrast between high and low level nuclear wastes and their associated hazards.
- ✓ Investigate and describe how the sun produces energy in a range of wavelengths within the **electromagnetic spectrum**.
- ✓ Compare and contrast the nuclear processes that occur in the sun and stars as well as in nuclear reactors.
- Explain how nuclear reactions convert small amounts of matter into a relatively large amount of energy.

Standard 6: *Structure and Function*

Students understand that all life forms, at all levels of organization, use specialized structures and similar processes to meet life's needs.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Explain how disease is a breakdown in structures or functions of an organism due to intrinsic system failures or damage caused by infection.
- ✓ Investigate and describe how multicellular living things have tissues, organs, and organ systems that are specialized to perform life functions.
- ✓ Investigate and describe how cells grow, divide, and take in nutrients, which they use to provide energy for cellular functions.
- Investigate and describe how most organisms are comprised of a single cell and others are multicellular.
- ✓ Investigate and describe how plants have specialized structures and systems for a variety of functions.
- ✓ Explain how information used to guide cellular functions is stored in **DNA**.

Standard 7: *Internal and External Influences on Organisms*

Students understand that organisms respond to internal and external influences.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Explain how behavior may be innate or learned.
- ✓ Explain how an organism's behavior is based on experience and on the species' evolutionary history.
- Investigate and describe how behavior is one kind of response an organism can make to an internal or environmental stimulus.
- ✓ Explain how various **viruses**, **bacteria**, **fungi**, and **parasites** may infect the human body and interfere with normal body functions.

Standard 8: *Heredity and Diversity*

Students understand that life forms are diverse, and that they pass some characteristics to their offspring.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Explain how heredity is the passage of genetic instructions from one generation to another.
- Classify organisms on the basis of similar characteristics, and explain the basis for such a classification system.
- Explain how new varieties of cultivated plants and domestic animals have resulted from **selective breeding** for particular traits.
- ✓ Explain how genetic information coded in DNA is passed through sexual or asexual reproduction.
- ✓ Explain how some patterns of inheritance can be explained by pairs of genes that separate when sex cells are formed.
- ✓ Identify that the basic level of biological classification is the species, which comprises all organisms that can mate with each other and produce fertile offspring.
- ✓ Explain how changes in the genes of sex cells can affect offspring.

Standard 9: *Evolution – The Process of Biological Change*
Students understand that life forms change over time.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Explain that millions of species of animals, plants, and microorganisms are alive today.
- ✓ Investigate and describe how biological evolution provides a scientific explanation for the differences and many similarities between species.
- ✓ Investigate and describe how unity among organisms is found in similarities of internal structures, chemical processes, and modern evidence of common ancestry.
- ✓ Explain how extinction of a species occurs when the adaptive characteristics of a species are insufficient to allow it to survive environmental change.

Standard 10: *Earth Structures and Composition*

Students understand that the Earth is composed of interrelated systems of rocks, water, air, and life.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Investigate and describe how rocks and minerals have different properties and characteristics.
- ✓ Investigate and describe how the combination of **constructive and destructive forces** result in the formation of landforms.
- ✓ Explain, using models, how the Earth is layered with a crust, both continental and oceanic, hot, convecting mantle, and dense, metallic core.
- Investigate and describe how soils have properties of color, texture, and capacity to retain water and provide nutrients for life.
- Explain how the atmosphere is a mixture of particular gases, whose properties vary with elevation.
- ✓ Explain that earthquakes, landslides, volcanoes, and floods are geologic phenomena.

Standard 11: *Earth Models*

Students understand that the Earth may be represented by a variety of maps and models.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Describe how positions on the Earth's surface can be located using latitude and longitude.
- Compare a variety of map types, and locate Nevada and Nevada features on each.
- ✓ Use a color-coded map to compare and contrast various geological features such as temperature, population density, geology, or precipitation.
- Identify the time of day in various places throughout the world, given the local time of day.

Standard 12: *Earth History*

Students understand that Earth systems (such as weather and mountain formation) change on variety.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Explain how some changes on the Earth's surface are due to slow processes, and others due to rapid processes.
- ✓ Investigate and describe how fossils provide important evidence of how life and environmental conditions have changed throughout geologic time.
- ✓ Explain how the Earth's processes we observe today are similar to those that occurred in the past.

Standard 13: *Cycles of Matter and Energy*

Students understand that Earth systems have a variety of cycles through which energy and matter continually flow.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Investigate and describe how the sun is the major source of energy for phenomena on Earth's surface (e.g., growth of plants, winds, ocean currents, and the water cycle).
- ✓ Explain how global patterns of atmospheric movement, topography, and proximity to bodies of water influence local weather, and seasons are caused by variations in the amount of the sun's energy hitting the surface due to the tilt of the Earth's axis.
- ✓ Explain how water, which covers the majority of the Earth's surface, circulates through the crust, oceans, and atmosphere.
- ✓ Simulate and describe how clouds, latitude, altitude, topographical features, and proximity to large bodies of water affect weather and climate.
 - Investigate and describe some changes that are reversible and others that are not.
 - Explain that the energy that the Earth receives over geologic time approximately equals the energy that it loses.
- ✓ Describe the relationships among **geothermal** and **tectonic** processes.

Standard 14: *The Solar System and the Universe*

Students understand that the Earth is part of a planetary system within the Milky Way Galaxy, which is part of the known universe.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Investigate and describe the size, composition, and surface features of the planets in our solar system.
- ✓ Investigate and describe how seasons, eclipses, moon phases, and tides are caused by the effects of relative motion and positions of the sun, Earth, and moon.
- Explain that billions of galaxies form most of the visible mass in the universe.
- Explain how various tools (e.g., optical and radio telescopes, unmanned robotic spacecraft) allow us to investigate objects in the sky that are too distant, faint, or bright to observe directly from Earth.
- ✓ Investigate and describe the laws of motion and gravity and their development.

Standard 15: *Ecosystems*

Students will demonstrate an understanding that ecosystems display patterns of organization, change, and stability as a result of the interactions and interdependencies among the life forms and the physical components of the Earth.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Investigate and describe how living and non-living components of ecosystems interact in various ways.
- Characterize organisms in any ecosystems by their function.
- ✓ Investigate and describe how the major energy source in most ecosystems is sunlight which is converted by producers into chemical energy.
- Describe how geographically distinct ecosystems on the Earth have similarities and differences.

Standard 16: *Natural Resources*

Students demonstrate and understand that natural resources include renewable and non-renewable materials and energy. All organisms, including human, use resources to maintain and improve their existence, and the use of resources can have positive and negative consequences.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Investigate and describe the identifying characteristics of renewable and non-renewable resources.
- ✓ Explain how some natural resources are limited in their abundance and/or accessible location (e.g., water in the desert).
- Investigate and describe the location and distribution of various natural resources.
- Investigate and describe how organisms alter their local environment through their use of natural resources.
- Describe how unintended consequences of technologies can cause resource depletion and environmental degradation, but technology can also increase resource availability, mitigate environmental degradation, and make new resources economical.

Standard 17: *Conservation*

Students understand that humans have the unique ability to change personal and societal behavior based on ethical considerations regarding other organisms, the planet as a whole and future generations.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Analyze different conservation options for Nevada's resources.
- Investigate and describe how in some ecosystems, populations of organisms are in **dynamic equilibrium**, and in other ecosystems they are not.
- Evaluate how changes in environments can be beneficial or harmful.
- Investigate and describe how actions which might affect Nevada's environment can be evaluated in terms of trade-offs that may have regional, national, or global effects.

Standard 18: *Scientific, Historical, and Technological Perspectives*

Students understand that science is a unique way of knowing about things. Many men and women have contributed to the traditions of science. The ability to pursue activities and careers in science is accessible to people from all cultures and all levels of ability.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Explain that scientific investigations involve the use of logic, respect for the rules of evidence, openness to criticism, and public reporting of methods and procedures.
- Explain that scientific inquiry done in a school setting is similar to what scientists do.
- Explain, using examples, that ancient peoples provided knowledge about the natural world that is still regarded as valid today, even though that knowledge may not have originated by scientific methods.
- Explain that scientists may work in teams and some may work alone, but all communicate extensively with each other.
- Explain that scientific inquiry and technological design have similarities and differences. Scientists propose explanations for questions about the natural world and engineers propose solutions relating to human problems, needs, and aspirations.
- ✓ Explain that scientific knowledge is revised through a process of incorporating new evidence gained through continual investigation.
- Identify and describe how science is subject to strengths and limitations related to other human social and intellectual activities.

Standard 19: *Reasoning and Critical Response Skills*

Students understand that many decisions require critical consideration of scientific evidence.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Identify and evaluate critically the use of statistics, data, and graphs.
- Give examples of human activities with their associated benefits, costs and risks.
- Analyze and describe a system for efficiency, optimal function, and possible sources of malfunction.
- ✓ Critically evaluate information to distinguish between fact and opinion when responding to information.

Standard 20: *Systems, Models, Risk, and Predictions*

Students understand that a variety of models can be used to describe or predict things and events.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Investigate and describe how different models can be used to demonstrate the same thing.
- Use a model to predict change (e.g., stream table).
- ✓ Identify and illustrate natural cycles within systems (e.g., water, planetary motion, climate, geological changes).
- ✓ Analyze data from two groups, comparing both their middles and ranges.
- Use a systematic approach to thinking critically about risks and benefits.

Standard 21: *Scientific Values and Attitudes*

Students understand that science is an active process of systematically examining the natural world.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Explain why it is important to keep honest, clear, and accurate records.
- Explain that hypotheses are valuable even if they turn out to be incorrect, if they lead to fruitful investigations.
- Describe how different explanations can often be given for the same evidence, and it is not always possible to tell which one is correct.

Standard 22: *Communication Skills*

Students understand that a variety of communication methods can be used to share scientific information.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Write clear, step-by-step instructions for a procedure.
- ✓ Organize information in tables and graphs and describe the relationships they reveal.
- Discuss scientific topics by paraphrasing, asking for clarification or elaboration, and expressing alternative positions using available multimedia resources.

Standard 23: *Scientific Applications of Mathematics*

Students understand that scientific inquiry is enhanced and often communicated by using mathematics.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- Explain that quantities can vary in proportion to one another. (e.g., the ratio of mass to volume in the calculation of density).
- State the purpose of each step in a calculation.
- Estimate probabilities of outcomes in familiar situations.
- ✓ Select and use the appropriate SI unit for a particular measurement (e.g., meters for length, seconds for time, and kilograms for mass).
- ✓ Judge whether repeated measurements and computations of quantities are reasonably precise and accurate.
- Make predictions based on all known data from similar conditions.

Standard 24: *Laboratory Skills and Safety*

Students can appropriately and safely apply the tools and techniques of scientific inquiry.

Grade 8 Progress Indicators

By the end of Grade 8, students know and are able to do everything required in the previous grades and:

- ✓ Use instruments and laboratory safety equipment properly.
- Handle and dispose of chemicals according to established standards.
- Choose appropriate common materials for making and repairing simple mechanical constructions.
- Keep an organized record of scientific investigations.
- Use appropriate technology in laboratory procedures for measuring, recording, and analyzing data (e.g., computers, graphing calculators, and probes).
- ✓ Design a controlled experiment.

The matrix below explains the configuration of the reading examination at grade 8.

CRT Grade 8 Science Examination Item Matrix						
Content Cluster/ Ability Level (Cognitive Domain)	C1 Physical Science (Standards 1-5)	C2 Life Science (Standards 6-9, including standards 15.1 & 15.2)	C3 Earth/Space/ Environmental Science (Standards 11- 17, including standard 15.3)	C4 Science Skills, Processes, and Investigations (Standards 18 - 24)	Total Items	Percent
A1 Conceptual Understanding	5	5	5	2	17	32
A2 Procedures	7	7	5	6	25	46
A3 Problem Solving	4*	4*	4*	0	12	22
Total Items	16	16	14	8	54	
Percent	29	29	28	14		100

* Indicates a constructed-response item

Constructed-Response Items

Constructed-response items present students with a question or questions that require students to respond in written form. Typically items ask students to not only recall knowledge, but also demonstrate more complex cognitive behaviors such as organizing, summarizing, comparing, relating, analyzing, inferring, concluding, predicting, solving, and/or applying. A constructed-response item can appear in several different formats and reflect either the A2 or A3 Ability Level. An item may be specific in its request or more open-ended.

Constructed-responses will have a set, which scaffolds the student's thinking, and directions for the task.

Students receive a score of 0-3 points on their answer, with 0 being the lowest and 3 being the highest. A score of 2 or 3 is deemed proficient. A student's score depends on how closely his or her answer matches the description in the item-specific rubric and the anchor papers for each constructed-response item.

For each constructed-response item, an item-specific rubric is designed based on the general rubric. (See below for example.) Anchor papers, which are exemplary responses of typical student responses at each score point, are selected to guide the trained readers who score students' responses.

Score Point	Description
3	Three key elements. AND Answer is complete, all parts of question are answered. Answer is correct, although there may be minor errors in some details of the answer. No major errors.
2	Two key elements. AND All parts of question are answered, although some parts of the answer may be incomplete or incorrect. Answer contains significant errors.
1	One key element. AND Answer is incomplete, only part of question is answered, or answer may contain significant errors. OR All parts of question are answered, although major errors/misconceptions are present in answer.
0	Although the student attempts to address the question, the response contains insufficient evidence of appropriate skills/knowledge to successfully accomplish the task.



GRADE 8 SCIENCE

Reporting Category: C1 – Physical Science (1.8.2)
Ability Level: A1 – Fundamental Principles
Performance Indicator: Describe the force (gravity) which makes objects fall and planets move in their orbits.

Test Item:

Which of the following is a force of attraction between all objects of the universe?

- A mass
- B inertia
- C gravity
- D friction

Correct Response C: Gravity is the attraction between all objects in the universe.

Response A: This response is incorrect. Mass is the amount of matter an object has. Mass does have a relation to gravitational pull but all matter, regardless of its position to another object, has mass.

Response B: This response is incorrect. Inertia is a force that applies to the resistance to change of motion.

Response D: This response is incorrect: Friction is a resistance to motion and has no relevance to gravity.

GRADE 8 SCIENCE

Reporting Category: C1 – Physical Science (Forces and Motion 1.8.1)
Ability Level: A2 – Conceptual Understanding
Performance Indicator: Describe the force (gravity) which makes objects fall and planets move in their orbits.

Test Item:

A volleyball player prepares to serve a ball during a match.



Which of the following best explains why the ball falls back down toward the player?

- A the attractive force between the ball and player
- B the surrounding air pressure acting on the ball
- C the force of gravity acting on the player
- D the force of gravity acting on the ball

Correct Response D: Gravitational attraction between the planet and the ball. This force pulls the ball to the ground.

Response A: This response is incorrect. The player did exert a force to push the ball into the air, but it was gravity that pulled the ball back down.

Response B: This response is incorrect. Air pressure is exerted onto the ball but from all directions. This pressure would be spread over the entire surface of the ball and would not force the ball to the ground.

Response C: This response is incorrect. Gravity does act on the player but this force has no relevance to the ball being pulled back down.

GRADE 8 SCIENCE

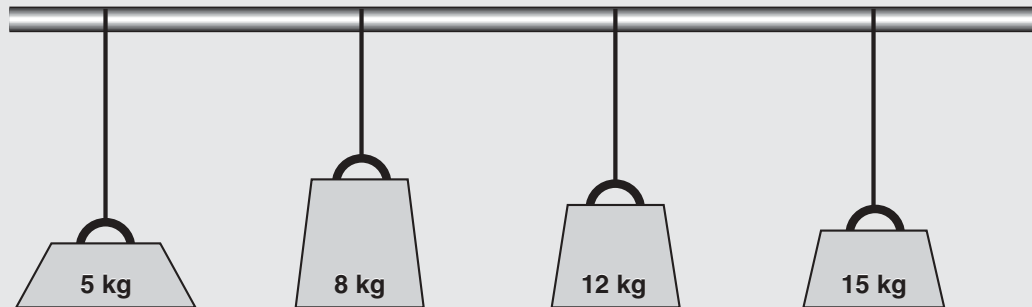
Reporting Category: C1 – Physical Science (1.8.2)

Ability Level: A3 – Practical Reasoning

Performance Indicator: Describe the force (gravity) which makes objects fall and planets move in their orbits.

Test Item:

All four weights are suspended eight feet above the ground.



- A Which weight will have the greatest gravitational attraction?
- B If all four weights were released at the same time, what would be the result?
- C What other factor could influence the rate at which the weights fall?

Complete and Correct Response (similar to the following)

Three key elements

Part A

One key element:

- The 15 kg has the greatest mass of the four weights, giving it the greatest gravitational attraction.

Part B

One key element:

- The weights would all touch the ground at the same time.

Part C

One key element:

Any of the factors that could influence the rate the weights fall are

- wind resistance
- air pressure
- shape of the weights
- human error

GRADE 8 SCIENCE

Score Point	Description
3	Three key elements. AND Answer is complete, all parts of question are answered. Answer is correct, although there may be minor errors in some details of the answer. No major errors.
2	Two key elements. AND All parts of question are answered, although some parts of answer may be incomplete or incorrect. Answer contains significant errors.
1	One key element. AND Answer is incomplete, only part of the question is answered, or answer may contain significant errors. OR All parts of question are answered, although major errors/misconceptions are present in answer.
0	Although the student attempts to address the question, the response contains insufficient evidence of appropriate skills/knowledge to successfully accomplish the task.

GRADE 8 SCIENCE

Reporting Category: C1 – Physical Science (Forces and Motion 1.8.3)

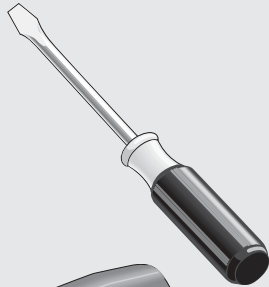
Ability Level: A1 – Fundamental Principles

Performance Indicator: Investigate and describe that certain physical principles are used in the design and function of simple machines.

Test Item:

Which simple machine is designed to lift heavy objects?

A



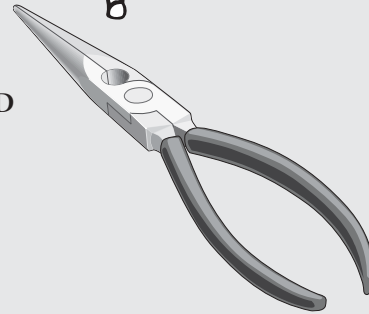
B



C



D



Correct Response C: The pulley is designed to make work easier when lifting heavy objects.

Response A: This response is incorrect. The screwdriver is designed to apply force in a twisting motion.

Response B: This response is incorrect. The mallet is designed to apply force in a downward motion.

Response D: This response is incorrect. The pliers are designed to grasp or hold an object.

GRADE 8 SCIENCE

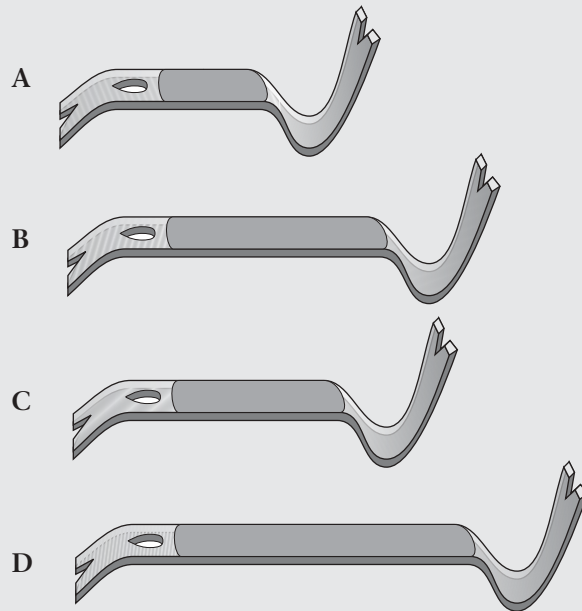
Reporting Category: C1 – Physical Science (Forces and Motion 1.8.3)

Ability Level: A2 – Conceptual Understanding

Performance Indicator: Investigate and describe that certain physical principles are used in the design and function of simple machines.

Test Item:

Which of the following crowbars would most likely require the least amount of force to pull out a nail from a board.



Correct Response D: The crowbar with the longest lever will require the least amount of force exerted to remove the nail.

Response A: This response is incorrect. The shortest lever will require the most force to be exerted on the handle to remove the nail.

Response B: This response is incorrect. Shorter levers require more force to be exerted on the handle to remove the nail.

Response C: This response is incorrect. Shorter levers require more force to be exerted on the handle to remove the nail.

GRADE 8 SCIENCE

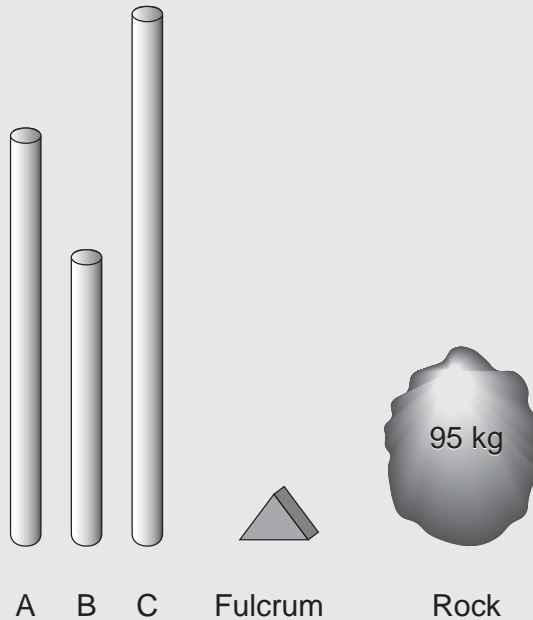
Reporting Category: C1 – Physical Science (Forces and Motion 1.8.3)

Ability Level: A3 – Practical Reasoning

Performance Indicator: Investigate and describe that certain physical principles are used in the design and function of simple machines.

Test Item:

A large rock needs to be moved using a long metal bar.



- A Using the materials above, draw a procedure you would follow to move the rock using the least amount of force.
- B How can the position of the fulcrum affect the work of moving the rock?
- C Except for the rock, what changes should be made to the materials to make the work of moving the rock easier?

Complete and Correct Response (similar to the following)

Key elements

Part A

Two key elements:

- Diagram showing bar C wedged under the rock.
- Diagram showing the fulcrum position being under bar C and close to the rock.

Part B

One key element:

- The fulcrum should be placed closely to the rock to make the work easier. The further away the fulcrum is from the rock, the more force is needed to move it.

GRADE 8 SCIENCE

Part C

One key element:

Any of the following factors:

- The fulcrum needs to be larger.
- C metal bar could be longer.
- Add more C metal bars under the rock.

Score Point	Description
3	Four key elements. AND Answer is complete, all parts of question are answered. Answer is correct, although there may be minor errors in some details of the answer. No major errors.
2	Two or three key elements. AND All parts of question are answered, although some parts of answer may be incomplete or incorrect. Answer contains significant errors.
1	One key element. AND Answer is incomplete, only part of the question is answered, or answer may contain significant errors. OR All parts of question are answered, although major errors/misconceptions are present in answer.
0	Although the student attempts to address the question, the response contains insufficient evidence of appropriate skills/knowledge to successfully accomplish the task.

GRADE 8 SCIENCE

Reporting Category: C2 – Life Science (6.8.2)
Ability Level: A1 – Fundamental Principles
Performance Indicator: Investigate and describe how multicellular living things have tissues, organs and organ systems that are specialized to perform life functions.

Test Item:

Which of the following organ systems is responsible for a species making more of the same species?

- A reproductive system
- B circulatory system
- C digestive system
- D skeletal system

Correct Response A: The reproductive system is responsible for the production of sperm and egg cells. When fertilization occurs, an offspring is produced and the next generation of a species is produced.

Response B: This response is incorrect. The circulatory system carries needed oxygen throughout the body.

Response C This response is incorrect. The digestive system is responsible for the breakdown of nutrients that are consumed by the organism.

Response D: This response is incorrect. The skeletal system is designed to support and protect the internal structures of the organism.

GRADE 8 SCIENCE

Reporting Category: C2 – Life Science (6.8.2)
Ability Level: A2 – Conceptual Understanding
Performance Indicator: Investigate and describe how multicellular living things have tissues, organs and organ systems that are specialized to perform life functions.

Test Item:

A multicellular organism, like human, is made up of like cells that combine to form like tissues. When like tissues combine, they form like

- A animals.
- B organs.
- C specialized cells.
- D organ systems.

Correct Response B: Like cells form like organs. According to the levels of organization pyramid, complex living systems can be broken down into molecular components.

Response A: This response is incorrect. Several levels of organization have been omitted. Like tissues do not form like animals. An animal is an organism, and organ systems working together form an organism.

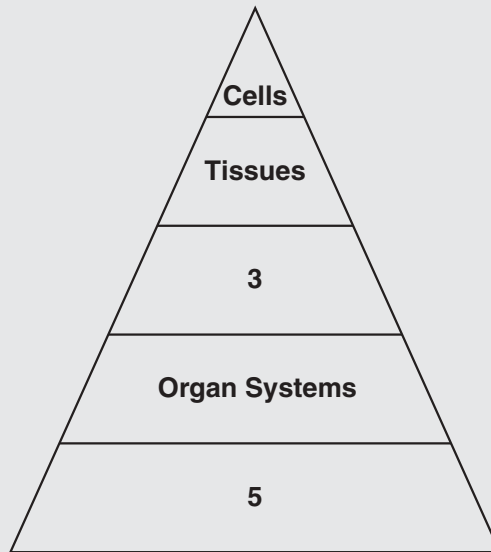
Response C: This response is incorrect. Like tissues do not regress in complexity and form specialized cells. Cells are less complex than tissues.

Response D: This response is incorrect. Like tissues do not form organ systems. The presence of an organ is necessary to form an organ system.

GRADE 8 SCIENCE

Reporting Category:	C2 – Life Science (6.8.2)
Ability Level:	A3 – Practical Reasoning
Performance Indicator:	Investigate and describe how multicellular living things have tissues, organs and organ systems that are specialized to perform life functions.
Test Item:	

The levels of organization are shown below with some information missing from the pyramid.



- A What term belongs in position 3 of the pyramid? Explain.
- B Which term belongs in position 5 of the pyramid? Explain.
- C Based on your knowledge of the levels of organization, give a brief explanation of the design of the pyramid.

Complete and correct response (similar to the following)

Five key elements

Part A

Two key elements:

The term that applies to position three:

- Organs

Explanation:

- When tissues with the same function work together with other tissues of the same function an organ is formed.

Part B

Two key elements:

The term that belongs in position five:

- Organism

Explanation:

- When the different systems work together, a functioning organism is formed.

GRADE 8 SCIENCE

Part C

One key element:

An explanation to the design of the pyramid:

- It's designed to show how each level creates the next level. It shows the interconnection between each level.

Score Point	Description
3	Five key elements. AND Answer is complete, all parts of question are answered. Answer is correct, although there may be minor errors in some details of the answer. No major errors.
2	Three to four key elements. AND All parts of question are answered, although some parts of answer may be incomplete or incorrect. Answer contains significant errors.
1	One or two key elements. AND Answer is incomplete, only part of the question is answered, or answer may contain significant errors. OR All parts of question are answered, although major errors/misconceptions are present in answer.
0	Although the student attempts to address the question, the response contains insufficient evidence of appropriate skills/knowledge to successfully accomplish the task.

GRADE 8 SCIENCE

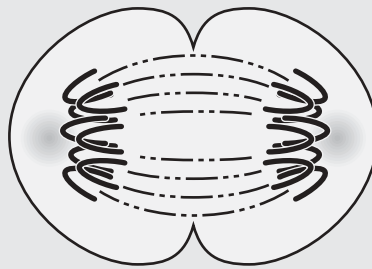
Reporting Category: C2 – Life Science (6.8.3)

Ability Level: A1 – Fundamental Principles

Performance Indicator: Investigate and describe how cells grow, divide, and take in nutrients, which they use to provide energy for cellular functions.

Test Item:

The cell below is in the telophase stage.



The cell is in the process of performing a specific reproductive function. It is most likely preparing to

- A grow.
- B divide.
- C digest.
- D excrete.

Correct Response B: Telophase is a stage of mitosis, a reproductive process of cells, that results in the even division of a cell.

Response A: This response is incorrect. The cell does not grow during the event of telophase. Its physical make up does not increase.

Response C: This response is incorrect. Digestion is the process of breaking down food to get nutrients.

Response D: This response is incorrect. Excretion is the removal of waste products.

GRADE 8 SCIENCE

Reporting Category: C2 – Life Science (6.8.3)

Ability Level: A2 – Conceptual Understanding

Performance Indicator: Investigate and describe how cells grow, divide, and take in nutrients, which they use to provide energy for cellular functions.

Test Item:

Which of the following is produced by the plant cells when converting the sun's energy?

- A fats
- B proteins
- C sugars
- D water

Correct Response C: Plant cells convert the sun's energy into sugars that are broken down for energy.

Response A: This response is incorrect. Fats are a source of energy but are not produced by plant cells as an energy source.

Response B: This response is incorrect. Proteins are a source of energy but are not produced by plant cells for use in their own cellular activities.

Response D: This response is incorrect. Water is necessary for life, but water is absorbed by cells, not produced.

GRADE 8 SCIENCE

Reporting Category: C2 – Life Science (6.8.3)
Ability Level: A3 – Practical Reasoning
Performance Indicator: Investigate and describe how cells grow, divide, and take in nutrients, which they use to provide energy for cellular functions.
Test Item:

Write your answer to Question # on Page # in your Answer Booklet. Be sure to answer Parts A, B, and C.

Father and son both contain cells.



- A How are the number of cells different between the father and son?
- B Which life process is responsible for the creation of more cells?
- C Explain the importance of the life process in part B.

Complete and Correct response (similar to the following)

Key elements

Part A

One key element:

- The father will have a greater number of cells than the son since he is older and has had more time for cells to reproduce.

Part B

One key element:

- The reproductive process is responsible for creating more cells through cell division.

Part C

One key element:

- Reproduction of cells assists several processes that aid in the survival of the organism such as growth, development, healing, and maintenance.

GRADE 8 SCIENCE

Score Point	Description
3	Three key elements. AND Answer is complete, all parts of question are answered. Answer is correct, although there may be minor errors in some details of the answer. No major errors.
2	Two key elements. AND All parts of question are answered, although some parts of answer may be incomplete or incorrect. Answer contains significant errors.
1	One key element. AND Answer is incomplete, only part of the question is answered, or answer may contain significant errors. OR All parts of question are answered, although major errors/misconceptions are present in answer.
0	Although the student attempts to address the question, the response contains insufficient evidence of appropriate skills/knowledge to successfully accomplish the task.

GRADE 8 SCIENCE

Reporting Category: C2 – Life Science (7.8.1)
Ability Level: A1 – Fundamental Principles
Performance Indicator: Explain how behavior may be innate or learned.
Test Item:

Which of following is a learned behavior?

- A cat meowing
- B fish swimming
- C bird stretching its wings
- D dog playing dead

Correct Answer D: The dog must be taught to play dead.
Response A: This response is incorrect. Kittens are born with the ability to meow.
Response B: This response is incorrect. Fish are born with the ability to swim.
Response C: This response is incorrect. Birds are born with the ability to stretch their wings.

GRADE 8 SCIENCE

Reporting Category: C2 – Life Science (7.8.1)
Ability Level: A2 – Conceptual Understanding
Performance Indicator: Explain how behavior may be innate or learned.

Test Item:

A newly hatched alligator is able to swim at birth. It's able to swim because it

- A learned to swim while in the egg.
- B watched other alligators swimming.
- C was trained by its mother.
- D was born with the ability to swim.

Correct Answer D: Innate behaviors are those behaviors the animal is born with.

Response A: This response is incorrect. The developing alligator's egg environment is not similar to a pond or a river, but there are other animals hatched from eggs that cannot swim at birth such as robins or sparrows.

Response B: This response is incorrect. Baby alligators immediately enter the water at birth. Other large alligators are predators that baby alligators would avoid.

Response C: This response is incorrect. Mother alligators protect their young but do not train them.

GRADE 8 SCIENCE

Reporting Category: C2 – Life Science (7.8.1)
Ability Level: A3 – Practical Reasoning (open ended)
Performance Indicator: Explain how behavior may be innate or learned.

Test Item:

Write your answer to Question # on Page # in your Answer Booklet. Be sure to answer Parts A and B.

- A Explain why a dog must be taught to fetch a newspaper.
B Identify and explain two behaviors that are instinctive for a dog.

Complete and correct response (similar to the following)

Key elements

Part A

One key element:

A dog must be taught to fetch a newspaper because:

- The dog is not born knowing how to fetch a stick. It needs to be taught by giving it treats or a pat on the head.

Part B

Two key elements:

Identify two behaviors that are instinctive:

- drinking
- wagging its tail
- barking
- standing
- eating

Explain the behaviors

- The dog is born with the abilities listed above. They do not need to be taught to the dog.

GRADE 8 SCIENCE

Score Point	Description
3	Three key elements. AND Answer is complete, all parts of question are answered. Answer is correct, although there may be minor errors in some details of the answer. No major errors.
2	Two key elements. AND All parts of question are answered, although some parts of answer may be incomplete or incorrect. Answer contains significant errors.
1	One key element. AND Answer is incomplete, only part of the question is answered, or answer may contain significant errors. OR All parts of question are answered, although major errors/misconceptions are present in answer.
0	Although the student attempts to address the question, the response contains insufficient evidence of appropriate skills/knowledge to successfully accomplish the task.

GRADE 8 SCIENCE

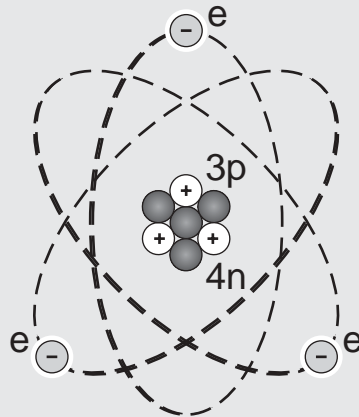
Reporting Category: C1 – Physical Science (2.8.4)

Ability Level: A1 – Fundamental Principles

Performance Indicator: Explain that all atoms are made of protons, neutrons, and electrons.

Test Item:

An arrangement of protons, neutrons, and electrons is shown below.



Which term best describes the structure above?

- A cell
- B atom
- C compound
- D mixture

Correct Response B: The arrangement of particles represents an atom.

Response A: This response is incorrect. Cells can contain atoms, however, organelles must be present for the arrangement to represent a cell.

Response C This response is incorrect. A compound is made of two or more elements. Only one element is shown in the picture above.

Response D: This response is incorrect. A mixture is a blend of two or more kinds of matter.

GRADE 8 SCIENCE

Reporting Category: C1 – Physical Science (2.8.4)
Ability Level: A2 – Conceptual Understanding
Performance Indicator: Explain that all atoms are made of protons, neutrons, and electrons.

Test Item:

An electron is a negatively charged particle. It can be found in which of the following?

- A protons
- B atoms
- C nuclei
- D neutron

Correct Response B: Atoms contain negatively charged particles called electrons.

Response A: This response is incorrect. Positively charged protons are found within the atom. Protons do not contain electrons.

Response C: This response is incorrect. Nuclei only contain protons and neutrons.

Response D: This response is incorrect. Neutrons are found within the nucleus of the atom. Neutrons do not contain electrons.

GRADE 8 SCIENCE

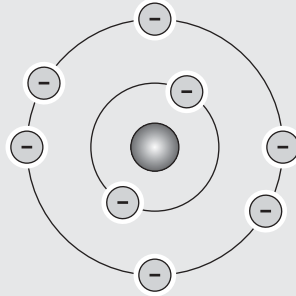
Reporting Category: C1 – Physical Science (2.8.4)

Ability Level: A3 – Practical Reasoning

Performance Indicator: Explain that all atoms are made of protons, neutrons, and electrons.

Test Item:

Oxygen is a common element found in our atmosphere.



A Identify the type of structure shown in the picture above.

B Identify the three particles that make up the above structure and the charges they carry.

Complete and correct response (similar to the following)

Key elements

Part A

One key element:

The type of structure is identified as:

- an atom

Part B

Three key elements:

The particles of the atom are identified along with their charges:

- Electrons, they have a negative charge.
- Protons, they have a positive charge.
- Neutrons, they have no charge.

GRADE 8 SCIENCE

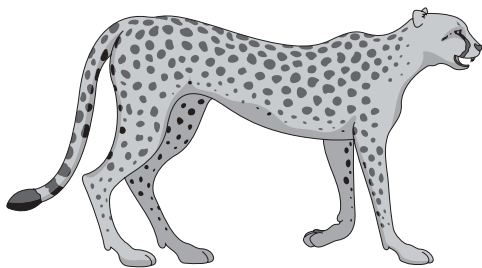
Score Point	Description
3	Four key elements. AND Answer is complete, all parts of question are answered. Answer is correct, although there may be minor errors in some details of the answer. No major errors.
2	Two or three key elements. AND All parts of question are answered, although some parts of answer may be incomplete or incorrect. Answer contains significant errors.
1	One key element. AND Answer is incomplete, only part of the question is answered, or answer may contain significant errors. OR All parts of question are answered, although major errors/misconceptions are present in answer.
0	Although the student attempts to address the question, the response contains insufficient evidence of appropriate skills/knowledge to successfully accomplish the task.

SCIENCE SAMPLE TEST QUESTIONS

- 1** Organisms may be classified as a species if they

A mate and produce fertile offspring.
B are similar in physical structure.
C adapt to environmental changes.
D have similar life cycles.

- 2** Cheetahs have a body design adapted to a particular environment.



Which environment would the cheetah experience the most success as a hunter?

A steep mountains
B muddy swamps
C open grasslands
D dense rainforests

- 3** The discovery of giant ground sloth fossils provides evidence that the environment was once covered by

A tall, dense forests.
B snow and glaciers.
C dry, windy deserts.
D swamps and marshes.

- 4** The main energy source responsible for tides on Earth is the

A wind.
B moon.
C sun.
D water.

- 5** Producers take the sun's energy and convert it into

A heat energy.
B chemical energy.
C solar energy.
D electrical energy.

SCIENCE SAMPLE TEST QUESTIONS

- 6** The data below was collected by two different classes. They wanted to compare temperature ranges during the school year.

<u>CLASS A</u>		<u>CLASS B</u>	
Date	Temperature (in degrees C)	Date	Temperature (in degrees C)
10/02	85	12/02	54
10/06	83	12/11	57
10/15	78	12/15	47
10/22	79	12/21	44
11/01	75	01/04	48
11/08	68	01/07	46
11/11	65	01/08	37
11/16	60	01/14	22
11/27	60	01/28	45

Which of the following is the correct temperature range difference between the classes?

- A 10
- B 12
- C 20
- D 22

SCIENCE SAMPLE TEST QUESTIONS

- 7 An entomologist must measure the wingspan of this butterfly to collect data on its growth rate.



Which of the following lengths of measurement should be used?

- A meters
- B kilometers
- C yards
- D centimeters

- 8 A ruler should be used in an experiment to

- A stir a prepared solution.
- B filter solids from a mixture.
- C remove a specimen from a jar.
- D measure the length of a specimen.

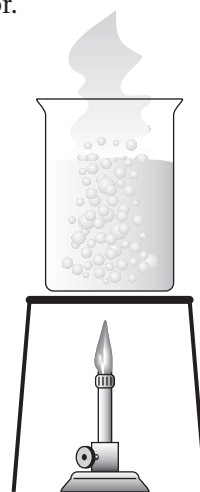
- 9 According to the Periodic Table, which of the following elements will have the properties of a gas?

- A carbon
- B boron
- C neon
- D sodium

- 10 The rotation of a windmill best represents which type of energy?

- A potential
- B kinetic
- C thermal
- D electrical

- 11 A beaker of water is heated to produce water vapor.

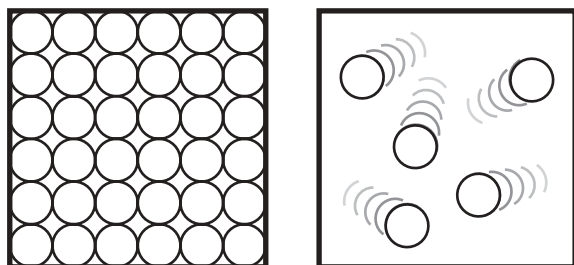


The process that transfers heat in water vapor is called

- A conduction.
- B convection.
- C radiation.
- D condensation.

SCIENCE SAMPLE TEST QUESTIONS

- 12** The particles below represent phase changes in matter from a solid to a gas.



What also needs to happen for these changes to occur?

- A Water needs to be added to the matter.
 - B Changes in energy are required.
 - C The amount of matter needs to be increased.
 - D Water needs to be removed from the matter.
- 13** Which of the following is a virus that can cause a disease?

- A green algae
- B lichens
- C tapeworms
- D polio

- 14** Cellular functions are guided by DNA, which contains

- A information.
- B carbon dioxide.
- C oxygen.
- D light energy.

- 15** Which molecule **best** shows how one carbon atom will bond with four hydrogen atoms?

A H-H-C-H-H

B $\begin{array}{c} \text{H} \\ | \\ \text{H}-\text{C}-\text{H} \\ | \\ \text{H} \end{array}$

C C-H-H-H-H

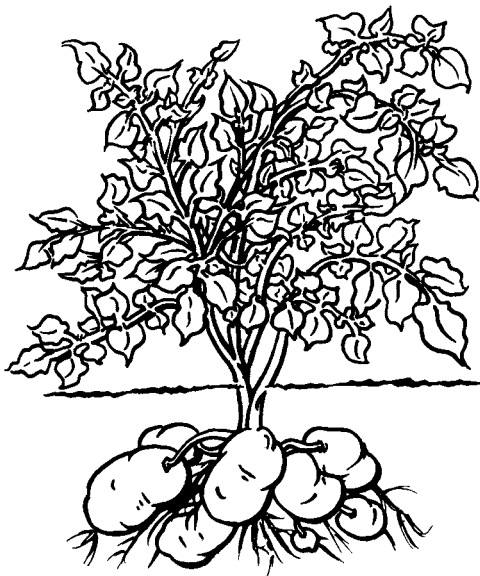
D $\begin{array}{c} \text{H}-\text{H} \\ | \\ \text{C} \\ | \\ \text{H}-\text{H} \end{array}$

- 16** Cacti have developed many special traits to aid in survival. The thorns of a cactus are actually its modified leaves. Which other trait has helped the cactus survive its desert environment?

- A thick bark to protect the plant from water loss
- B green pigment that reflects all the sun's rays
- C small roots systems that limit water absorption
- D cells with large vacuoles that store water

SCIENCE SAMPLE TEST QUESTIONS

- 17** Examine the physical characteristics of the potato plant below.



Which plant structure has become specialized in water storage?

- A roots
 - B stems
 - C leaves
 - D flowers
- 18** The resistance of an object to change its motion is
- A inertia.
 - B gravity.
 - C acceleration.
 - D velocity.

- 19** When bacteria infect a host and reproduce in large numbers, the toxins they release can result in the organism's death. The death of the organism is most likely the result of

- A a weakened immune system.
- B poor circulation to the brain.
- C low oxygen levels in the muscles.
- D low numbers of reproductive cells.

- 20** A palm leaf fossil was discovered in a desert environment. Which of the following most likely explains this observation?

- A The fossil was relocated due to shifting faults in the area.
- B The fossil was carried downstream by strong river currents.
- C The palm was blown over the mountains and later became fossilized.
- D The palm was once a part of a thriving ancient forest ecosystem.

- 21** Carcinogens, cancer-causing agents, can be inhaled. As cancer cells reproduce, the disease progresses within the organism. Which system will most likely break down first?

- A reproductive system
- B nervous system
- C respiratory system
- D digestive system

SCIENCE SAMPLE TEST QUESTIONS

- 22** The passage of genetic instructions from parent to offspring is

A heredity.
B development.
C growth.
D evolution.

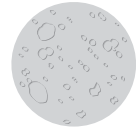
- 23** The father and son look very similar to each other.



Which of the following is responsible for these similarities?

A mitosis
B heredity
C respiration
D evolution

- 24** Carefully examine the changes in the position of the Earth and moon in the picture below.



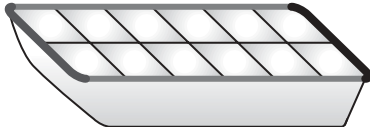
Which of the following would increase the gravitational attraction between the Earth and the moon?

A moving them closer together
B reversing their revolution
C Earth moving closer to the sun
D Earth losing some of its mass

SCIENCE SAMPLE TEST QUESTIONS

Write your answer to Question 25 in your Answer Booklet.

- 25** Water can come in three phases as shown below.



Solid



Liquid

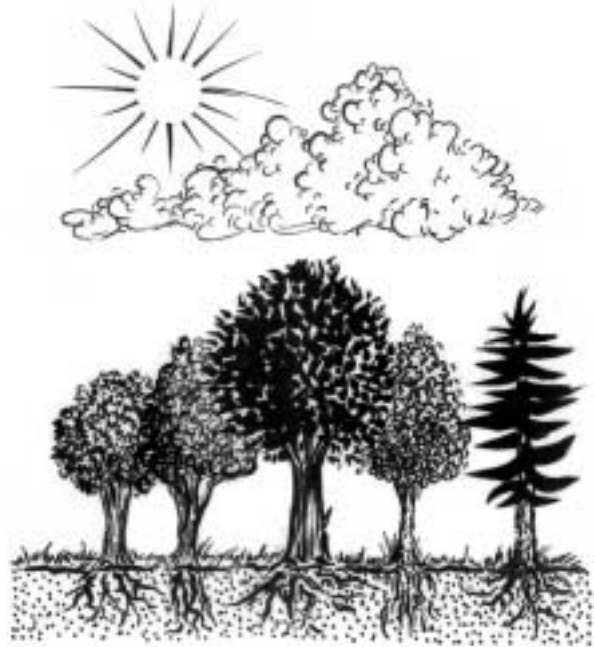


Gas

Explain the motion and position of the particles in each of the phases above.

Write your answer to Question 26 in your Answer Booklet.

- 26** A forest ecosystem is shown below.



Describe three examples of how living things interact with non-living things in the ecosystem above.

SCIENCE SAMPLE TEST ANSWER KEY

Item Number	Reporting Category	Ability Level	Answer Key
1	C2	A1	A
2	C2	A2	C
3	C3	A2	A
4	C3	A1	C
5	C3	A1	B
6	C4	A1	A
7	C4	A1	D
8	C4	A2	D
9	C1	A1	C
10	C1	A1	B
11	C1	A1	B
12	C1	A1	B
13	C2	A1	D
14	C2	A1	A
15	C1	A2	B
16	C2	A1	D
17	C2	A2	A
18	C1	A1	A
19	C2	A1	A
20	C3	A2	D
21	C2	A2	C
22	C2	A1	A
23	C2	A2	B
24	C1	A2	A
25	C1	A3	*
26	C2	A3	*

* Indicates a constructed-response item. See the following pages for the rubrics and sample responses.

SCIENCE SAMPLE TEST ANSWER KEY

Rubric for Question 25

Three key elements

Explain the motion of the particles in the three phases:

- In the solid state the particles are arranged closely together and there is very little movement.
- In the liquid state the particles move farther away from each other and movement is increased.
- In the gas state the particles are colliding with each other and moving very fast.

Score Point	Description
3	Three key elements. AND Answer is complete, all parts of question are answered. Answer is correct, although there may be minor errors in some details of the answer. No major errors.
2	Two key elements. AND All parts of question are answered, although some parts of answer may be incomplete or incorrect. Answer contains significant errors.
1	One key element. AND Answer is incomplete, only part of the question is answered, or answer may contain significant errors. OR All parts of question are answered, although major errors/misconceptions are present in answer.
0	Although the student attempts to address the question, the response contains insufficient evidence of appropriate skills/knowledge to successfully accomplish the task.

SCIENCE SAMPLE TEST ANSWER KEY

Rubric for Question 26

Three key components

Describe any three of the following examples of the non-living interacting with the living in an ecosystem:

- The living plants take in the carbon dioxide in the non-living air to help with photosynthesis.
- The living plants take in nutrients from the non-living soil through their roots.
- The living plants absorb non-living sunlight to convert it into chemical energy to grow.
- The living bacteria in the soil get nutrients from dead organic matter in the soil.

Score Point	Description
3	Three key elements. AND Answer is complete, all parts of question are answered. Answer is correct, although there may be minor errors in some details of the answer. No major errors.
2	Two key elements. AND All parts of question are answered, although some parts of answer may be incomplete or incorrect. Answer contains significant errors.
1	One key element. AND Answer is incomplete, only part of the question is answered, or answer may contain significant errors. OR All parts of question are answered, although major errors/misconceptions are present in answer.
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